

FLIGHT

&
The AIRCRAFT
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

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EDITORIAL COMMENT.



We stand now on the threshold of the fourth winter of war. At this time last year the hope was cherished that 1917 would see the decisive defeat of the Hun, and that our men would be spared another winter of the appalling life of the trenches. Had it not been for the Russian debacle those hopes might well have been realised, but, as we know now to our sorrow, they have not materialised into accomplished fact, and we are left to contemplate with what satisfaction we can muster the certainty of another winter of war. Now, the winter is the time when both sets of belligerents have leisure from the actual work of fighting to take stock of their position and to prepare plans and co-ordinate resources for the new campaign of the next spring. Already the enemy has laid his plans, and is busy with the preparations for translating them into deeds. He knows that in the spring of 1918 he is going to be faced with the full effective power of the United States, which, by then, will have

been added to that of the older partners of the Alliance, against whom alone he has not been able to stand during the fighting of 1917. But, despite that knowledge, he has not lost heart, and intends making the most desperate efforts not only to stave off actual defeat but to win the war. He has realised earlier than most that he has only one possible avenue open to him for the achievement of his object, and that is by the creation of an overpoweringly strong air service.

According to information which has recently come into the hands of the French General Staff, the number of German battle-planes is to be at least doubled during the winter, and the aeroplane and engine building factories throughout Germany are greatly enlarging their plants in accordance with this decision, as for some time has been plainly apparent would be the case. Switzerland is being laid under contribution. Two hundred and fifty Argus motors have been ordered from a firm in the Zurich district. The Fokker firm, which is building fighting biplanes in great numbers, as well as a new triplane of great speed and fighting power, has taken over the great Berzina piano factories in Schwerin. For bombing formations heavy three-seater machines—improved Gothas—are being built which can, it is said, carry between seventeen and eighteen hundred pounds weight of bombs. In every direction Germany is displaying feverish energy in the production of more, and yet more, aircraft. During the six months from February to August, 29 important industrial concerns were added to the number of factories making aeroplanes or their accessories in Germany. Simultaneously with this great increase in manufacturing power, the Germans are literally looking everywhere for recruits for the flying service. Applications for transfer to the air service are now received from both infantry and engineers, instead of being restricted to cavalry as was formerly the case. Applications are now dealt with in a month, and there is no doubt the personnel of the German flying service has been very largely increased during the current year. Volunteers are being asked for, principally for the fighting planes, but a large number of officers are also being trained as observers.

We have briefly detailed these facts in order the better to point the moral that Germany is leaving no stone unturned to meet the great Allied air offensive she expects in the early months of next year. It is axiomatic in war that the best plan of action is to

do the thing your enemy least desires you should do. We know that Germany views with dread the possibility of the aerial war being taken to her, as it were, in both hands, and nothing has produced so much misgiving in the minds of the enemy command as the promise that in the spring of 1918 the "air will be black with Allied aeroplanes." We have seen that this dread of the possibilities of the air has set the enemy to work at the very highest pressure on the production of means to meet the threat. We know, furthermore, that Germany is a nation of wonderful productive power, and that even yet we have not fully gauged her capacity for defensive war. Therefore, it falls to be questioned whether we on our side are doing our utmost that the threat of which we have spoken may become a decisive fact when the campaign of 1918 opens. Much has been done, and more is being done, to accelerate the production of the best types of machines, but it is not a question of much or more, but of the maximum. Nothing but the maximum is any good to us. It is of no use to argue that in view of the entry into the last phases of the war of thousands of American aeroplanes we can afford to be content with something less than our full output capacity. That will not do at all—it was our war before it was America's, and we have to go ahead with our preparations for winning it just as though we had nothing to hope from the direct intervention of the United States. We agree that American help is a very good thing to have, and that, with its co-operation, the war will be the sooner over, but it would be a deadly thing if the anticipation of that co-operation were to lead to the slightest lessening of effort on our own part. Are we doing all in our power to provide the necessary machines, engines and pilots to blot the Hun out of the air next spring? We sincerely hope we are. There are, nevertheless, still many abuses, many sources of leakage, which will have to be dealt with and removed before we are able to say that all is well, and it is during the coming winter that the last chance will be given us to set our aerial house in order.

Fortunately, there are not wanting signs that at last the Government has realised what so many far-sighted people have been insisting upon for the past two years—that the war will be won in the air—and is taking its plans accordingly. We trust it may achieve its object.

The Romance of Aerial Travel.

One of Reuter's correspondents has been interviewing the brothers Caproni, the famous constructors of the Italian Caproni aeroplane. In the light of what we know to-day regarding the actualities of aerial travel and our home-built machines, there does not seem to be much in the way of undue optimism, or of exaggeration of hope, in the opinions expressed by the famous Italian brothers in relation to aerial development after the war. Nevertheless, to the uninitiated the interview reads like a page from one of the more imaginative works of Jules Verne or H. G. Wells. According to the prophecy of the Signori Caproni, before the sound of the guns has well died away lines of aeroplanes will connect town with town, country with country, and continent with continent. There will be aerial "trains" luxuriously fitted up, capable of transporting upwards of a hundred passengers and

of travelling from 120 to 190 miles an hour. Immediately after the war large trans-oceanic aeroplanes will be built, powerful enough to carry from 50 to 60 passengers from Europe to America and back.

It is curious to reflect that not a single voice is raised to suggest that these are the dreams of enthusiasts to whom the belief is born of the desire that these things should come to pass. On the contrary, there is no one but takes the statements seriously and believes that they are all real and practical possibilities of the very near future. And why not? So far, no one has made the Atlantic journey, but we know nevertheless that the Atlantic is to be conquered just as soon as the end of the war sets free men's minds to the serious contemplation of the task—it has merely become a problem of opportunity more than of machinery. We have already progressed in less than a decade from the frail single-seater, with uncertain and under-powered motor, in flying which the pioneers took their lives in their hands, to the powerful multi-engined machines which will take twenty people up to ten thousand feet and maintain a speed far in excess of that of the fastest express train. Moreover, all our development during the last three years has been for the purposes of the war, and there has been scant opportunity, therefore, for finding out the real possibilities of passenger flight. Even such opportunities as have occurred have been under war conditions which precluded the securing of all the data we need to enable us to base a judgment of what is actually possible to-day. Thus we are driven to the conclusion that we do not actually know how far we have in reality progressed in what we may call utilitarian flight, nor what hitherto undreamed of wonders of the air will come to pass within a few short years.

"One Air Service; One Uniform; One Badge."

Now that we seem to be on the threshold of consummating the ideal of a single Imperial Air Service, certain critics of air policy seem to have suddenly discovered that about the worst thing in the world that could happen is the constitution of an Air Board on the lines so often laid down in these pages. Among the foremost of these is the *Morning Post*, which since the war has manifested a distinct tendency to go off at a tangent on the smallest provocation. It seems to have become an organ which simply *must* have opinions counter to the majority, and which cannot exist without a grievance—as witness the virulence of its attacks on the present Minister of Munitions.

In a long leading article on the subject, the *Post* criticises the predication of a contemporary that the requisite development "can only be brought about by an Air Service emancipated from military and naval control." In the view of the *Post* such a proposal seems to be equivalent to suggesting that artillery should be "emancipated" from military control or torpedoes from naval control! We are afraid our contemporary is suffering from the effects of too parochial an outlook, else it would have been able to appreciate the difference between the eminently sensible and the merely grotesque. It is probably quite well known to the *Post* that at one time in our history the English Fleet was controlled, commanded and fought by soldiers, while the "shipmen" were mere hewers of wood and drawers of water—people of no consideration, who simply had



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DIVERTING THE CARDINAL WOLSEY RIVER AT HANWORTH PARK.—Mr. H. Sykes, on his Martinsyde, looping in a gale of wind. The machine is travelling away from the spectator, and is in the inverted position.

to do as they were told by the knightly landmen who formed the military element of the fleet. As time went on and naval war developed the soldier disappeared, and the sailor became not only the navigator but the fighting man as well, and the Fleet came under the control of its own Board. Unfortunately, we have no access to the contemporary news sheets: indeed, we are not absolutely clear that there were any in the time of the transition, but we may be reasonably certain that, if there were, there was a *Morning Post* among them to predict that the whole show was going to the dogs!

For our own part, we certainly think that our own analogy of the control of the fleet passing from the soldier to the sailor in consequence of the development of war is a far better one than the feeble comparison between artillery and torpedoes. Our contemporary waxes eloquent on the theme, and desires to know why naval architecture should not be emancipated from the foolish interference of professional seamen, and why we should not free the construction of guns from the whims of the artillerist? It further goes on to say that the new proposal is to take from the army and the navy the initiative in design and the conduct of aerial war altogether. With regard to the first of these wild hypotheses, the analogy we have given of how the navy was freed from the control of the soldiers holds equally good. So far as concerns the latter, the answer is that the new proposal is not intended to do anything of the sort, and that this precise point has been one which has been most carefully safeguarded by every responsible advocate of the separate Air Service. This journal, for example, which has been a consistent advocate of the idea—as a matter of literal fact, it was “FLIGHT” which first enunciated it—has ever been careful to lay down that first and foremost must come the requirements of the armies in the field and the fleets at sea, and that until these have been met in the fullest possible manner there can be no question of anything else. The *Morning Post* says that “when the demands of the army are satisfied it is quite certain that there will be no material left over; and until they are satisfied, what possible excuse have the Government for proposing a diversion of force?”

Here again our contemporary has “gone off the rails.” It is not quite certain that when the demands of the army have been satisfied there will be no material left over. On the contrary, we have a great deal of reason to suppose that there will be a substantial margin left over. But supposing we admit the contention of the *Post* and that there is nothing left, where does it get the idea that a diversion of force is contemplated? Certainly we have seen no reason to think that—and we have not suddenly awakened to an interest in the subject. Again, our contemporary is seriously alarmed at the alleged decision of the Government to adopt a policy of reprisals, and asks what exactly is meant by a policy of reprisals. It then proceeds to interpret such a policy, and says that the R.F.C. and the R.N.A.S. have been conducting reprisals for months. They have, it proceeds, been attacking the vulnerable military positions of the enemy and thereby injuring his offensive power by the only means by which it can be injured. We put it to our contemporary that the direct military damage done to the enemy by the successful bombing of a munition factory is out of all proportion to that done by blowing

up one of his ammunition dumps behind the lines. We take it the *Post* will agree that it is more effective to destroy the snake and its whole brood in their habitat than to kill them singly at a distance from home, leaving the snake herself to produce more young. It seems to us that here is the answer and the explanation combined. Simply as laymen we should say that the bombing of dumps and railway stations and supply trains behind the lines is an absolutely necessary work, but that it is tactical work which belongs properly to the air squadrons operating with the field armies. The bombarding from the air of munition factories and other establishments engaged on war work within the enemy territory is strategical and belongs to the Air Service, and falls to be done *if and when* the field armies have been supplied with the necessary aircraft and after arrangements have been made to maintain a continuous supply. To argue as our contemporary permits itself to do seems to us equivalent to asking that the navy should be controlled by the War Office or the Army by the Board of Admiralty. However, despite the croakings of those who have just awakened to that fact that a decision has been taken to put matters aerial on a sound, sane basis, the plan is proceeding, and before long we shall see the consummation of the ideal of “One Air Service; One Uniform; One Badge.”

A Bill for the constitution of the Air Ministry as a separate Department of State has been prepared, and will shortly be introduced. We doubt not that it will pass both Houses with very little controversy, since all but a very few have come to realise the enormous importance of the aerial arm and the urgent necessity of dealing with its use and status immediately and permanently. The only comment it occurs to us to make on the subject is that if the Bill, as Mr. Bonar Law told the House last week, has actually been prepared, it would have been as well to introduce it without a moment's delay. We still think so.

Entry to the R.F.C.

Not a week passes but we receive a sheaf of letters from young men, asking for information as to how to join the R.F.C. with the object of becoming pilots. Recently an outline of the procedure to be followed has been made available, and in order to give it all the prominence possible we print it below:—

“The special training which flying officers receive during their cadetship and subsequent course of higher instruction is calculated to cultivate the technical skill which is so necessary to a successful pilot, but it is imperative that all candidates should be sufficiently well educated to take full advantage of their tuition. Previous mechanical knowledge is not necessary. Physique, character and keenness are of primary importance. As regards physique, candidates must not be over 6 ft. 1 in. in height, nor over 13 stones in weight; eyesight must be good, and before entering the cadet wing they must be passed ‘fit for general service’ by a Royal Army Medical Corps officer. The age limit is nominally 30 years, and candidates must be 18 years of age before admission to the officers' cadet wing. There is also a preliminary training wing to which candidates who are between the ages of 17 years 9 months and 17 years 10 months are admitted, and which may be regarded as a preparatory school for the officers' cadet wing. Lads who have joined this officers' technical training wing must, at the end of their course, when they reach the age of 18, be recommended anew by the commandant for admission to the officers' cadet wing.

“Application for admission to the officers' cadet wing or officers' technical training wing should be made in letter form, addressed to the Director of Air Organisation, Air Board Office, Strand, London. Full particulars of the candidate's

qualification, parentage, schools, &c., should be stated, and if approved he will be invited to a personal interview with a view to his selection and the completion of his official application form. All cadets have to attest before joining, and after joining they receive pay as a cadet until commissioned. The course at the cadet wing proper lasts for about two months. This course, devoted to instruction in military duties and drill, ends with a simple examination in these subjects. Cadets then proceed to a school of military aeronautics for instruction in technicalities, such as engines, appliances, construction of aeroplanes, and theory of flight. This course lasts six weeks. They are then given probationary temporary commissions on the general list for service with the Royal Flying Corps, drawing pay at the rate of 7s. 6d. per diem, plus 4s. flying pay, and are sent to elementary squadrons, where they are taken up in aeroplanes for first lessons in flying. Thence they advance to higher training squadrons, where they learn to fly Service machines under Service conditions, including air tactics, bombing, photography, and artillery observation. They then obtain their 'graduation certificates,' and are gazetted as 'flying officers,' entitling them to pay at the rate of £1 per diem with allowances. It will be seen that a successful pilot may arrive at his commission with the full pay and duties of a flying officer in from five to seven months after joining the officers' cadet wing, and it may be added that in the Royal Flying Corps the prospects of distinction and of subsequent promotion are unrivalled."

The Return of the Zeppelin.

It is certainly to the credit of the Germans that they succeeded in springing something of a surprise on us on Friday of last week. We had thought, after the fate which had overtaken their raiding Zeppelins at the end of last year, that the enemy would have concluded the game of attacking London by dirigible was one that had been demonstrated to be far from worth the attendant risks. However, they seem to have thought it well to make another essay, and certainly succeeded in reaching London with one out of probably eleven Zeppelins and dropping three bombs which only did, apart from the inevitable and regrettable loss of life, only very insignificant damage of any kind and absolutely none of the slightest military importance.

It was unfortunate that the conditions of atmosphere and the height at which the enemy raiders were flying prevented our air defences from getting at them, though it is satisfactory to know that it was largely the necessity for flying high and keeping quiet that really led to their undoing at the hands of the French air services. It seems clear that owing to the height at which they were compelled to fly and to the necessity for stopping their engines for long periods they were unable to get their motors going again, and thus fell victims to the efficiency of our gallant Allies.

It was perfectly natural that bombs having been dropped on London, with no visible reply from our own defences, the public should have wanted to know what, if anything, was wrong and who was responsible. Fortunately, Parliament is sitting, and it was thus possible to raise the matter on a motion for the adjournment and to get the facts from the Government.

As a matter of fact, we ourselves deprecate the manner in which the question was raised. It could have been just as well disposed of at question time in view of the explanations given by the Chancellor of the Exchequer. We agree with Mr. Bonar Law that if ever the Germans laughed at our methods of making war, they will do so when they read the reports of the debate on what has quite justly been called the greatest aerial defeat the enemy has ever sustained. It is an unquestioned and unquestionable fact that it is quite impossible to entirely prevent these raids. The one thing we can

do—and are doing—is to make them as dangerous as possible to the enemy, and when we are satisfied that this has been done it is humiliating to the last degree to hear people, as one member put it, squealing like a lot of frightened jays. The people of London are *not* panic-stricken—they are not even afraid of these raids, but if we were to take seriously all that is said and written by a very small minority we should be bound to conclude that our *morale* was in grave danger of going altogether. Nobody likes these raids. We all hate them, but that is a very different thing from the psychological state that the enemy will think he has reduced us to if we are going to make every raid the subject of a discussion on a motion to adjourn the House. We realise full well, as the Chancellor said, that the squealing comes from a very small minority, and that it does not represent the sense or feeling either of the House or the community, but the trouble is that it will be difficult to get the Germans to see this.

For Heaven's sake, let us look at the matter in its true perspective! Let us not lose all our sense of proportion!

We are far from being adherents to the "darkness and composure" theory. Quite the contrary, as our columns in the past have shown. We are all for a proper and far-sighted scheme of defence, and for carrying the air war into Germany. We believe we have got the first. It is not impregnable, for the best of all reasons that there is no such thing as an impregnable defence against aerial attack, as our own airmen are demonstrating every day of every week. That means, if it means anything, that we shall have more raids on British towns—as surely as dark follows light we shall have them whatever the quality of our defences. If we keep this in mind, as we must, then it seems to us that those who, admittedly with the best of motives, make a habit of demanding someone's head on a charger every time a raider penetrates our defences, are in reality doing a great national disservice by assisting to throw the people into a state of nerves, the next development of which is panic. That is the way the thing appeals to us, and so, we imagine, it will appeal to most. Do not play into the hands of the Boloists.

We have deprecated the manner in which the debate was raised, but at the same time we cannot but view with apprehension the manner in which the Speaker attempted to stifle it at its inception. He ruled that it was not competent to move the adjournment to discuss the failure of the Government to appoint an Air Minister, *because the appointment involved legislation which had been promised*. We know little and care less for the rules of the House of Commons, but if that is the rule in this particular situation then we do not like it at all. What it means is that the Government can delay indefinitely making good their pledge that an Air Ministry is to be created and that the question cannot be discussed by the House. If that is so, it seems to be an absolute negation of policy—something which is worthy of politics and politicians.

However, we trust the Government does not intend to use the rule in this case merely as a means of stifling discussion, and that it will proceed at once to the introduction of the promised Bill. There is certainly no time to lose if we are to have the advantages a separate Air Ministry will confer for the purposes of this war.

THE 120 H.P. SIX-CYLINDER UNION AERO ENGINE.

SOME particulars are to hand of an official test that was carried out recently by the United States Government on a 6-cylinder vertical water-cooled aero engine. This engine has been designed and constructed by the Union Gas Engine Co., of Oakland, Cal., U.S.A., a firm having a high reputation in connection with internal combustion engines dating back to 1885, when one of the first, if not the first, reversible marine gas engines was successfully operated in a launch. Since this date the firm have several notable achievements to their credit, including the production of some of the largest—600 h.p.—internal combustion marine engines in the world. In September, 1915, the first Union aero engine—consisting of a 2-cylinder section of the original 6-cylinder design—was constructed, and on its first trial made a non-stop run of 27 hours. After experimenting with this 2-cylinder model,

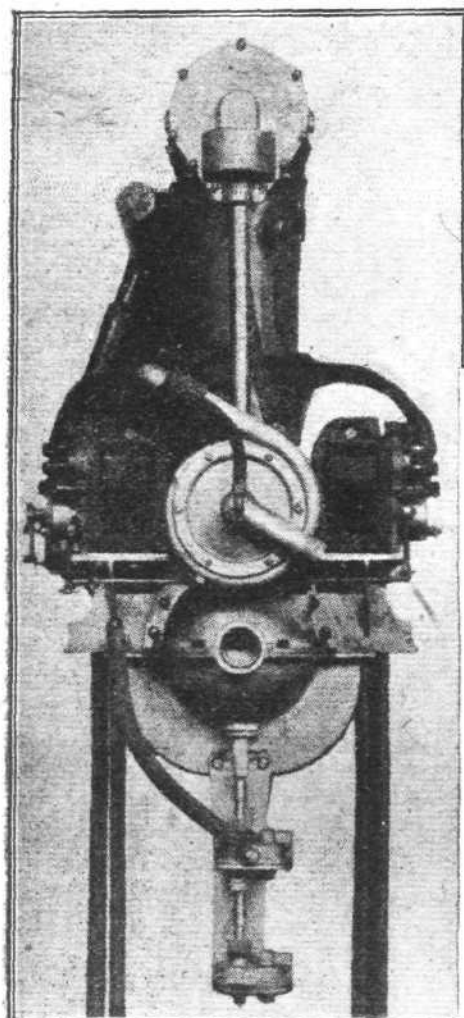
Camshaft pump and magneto gears.—Midvale chrome-nickel steel, heat-treated, and operating in oil baths.

Crankshaft.—Midvale chrome-nickel steel, heat-treated. Seven main bearings in addition to one outside thrust. The journals are $2\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins., and the crankpins are $2\frac{1}{2}$ ins. diameter by 3 ins. long. The thrust bearing is a two-way self-aligning bearing.

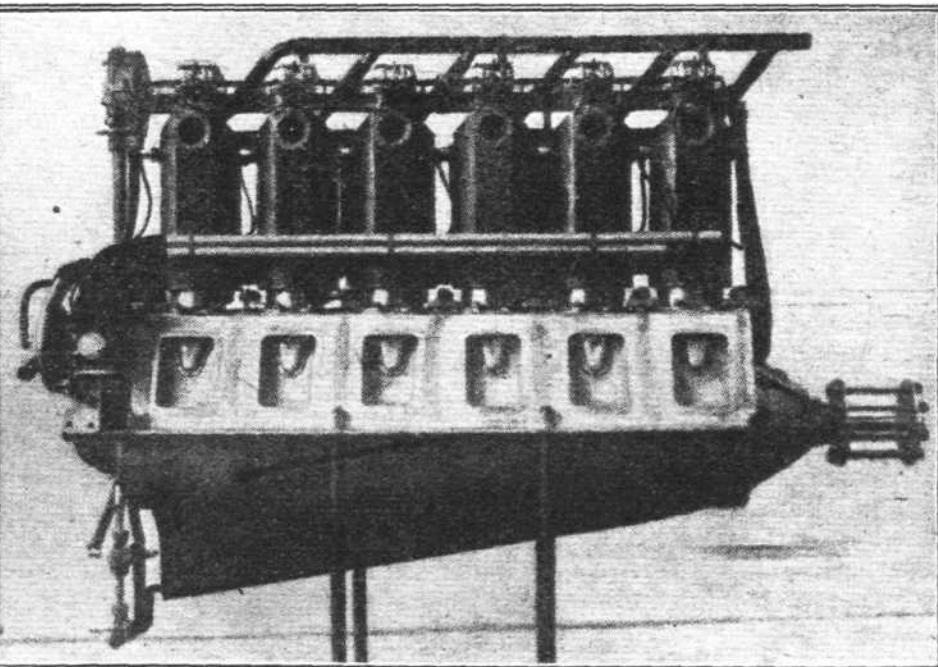
Pistons.—Lynnite aluminium alloy, 6 ins. long. In addition to two rings, there are seven grooves.

Connecting-rods.—I-section Midvale chrome-nickel steel, heat-treated, with holes drilled in web for lightness. Small-end bearings are $1\frac{1}{4}$ -in. by $2\frac{3}{4}$ ins.

Crankcase.—Aluminium alloy, thoroughly cross-webbed and with hollow box-section walls. Opposite each crank brass is a breather hole; the cold air entering the latter



Two views of the 120 h.p. 6-cyl. Union Aero Engine.—On the left an end view, showing the vertical drive to the overhead camshaft, the water pump, and the two lubricating pumps. The clean and simple design of this engine is clearly shown by the side view on the right.



the 6-cylinder engine under notice was produced, and we give some extracts from the official report on the test made with this engine.

The following is a general description of the engine:—

Type.—Vertical, six separate cylinders, water-cooled, overhead valves, $4\frac{3}{4}$ -in. bore by $6\frac{1}{2}$ -in. stroke.

Power.—Rated, 120 at 1,350 r.p.m. Maximum revolutions per minute, 1,420; minimum, 290.

Weight.—Including carburetors (2), magnetos (2), pumps and water piping, but excluding starting crank, exhaust pipes and propeller, 485 lbs.

Cylinders.—Steel, with semi-steel heads. Base flange integral with cylinder walls. Water-jackets copper, with brazed joints. Chrome-nickel studs extending from the main journal caps to the cylinder flanges take the upward thrust of the cylinders.

Valves.—Of E.W.P. alloy, with long stem guide, water-cooled for its entire length. The valve springs of the helical type, double, concentric, right and left hand. The rocker arms are machined from solid chrome-nickel steel forgings, heat treated. To prevent oil leakage the arm comes out of the top of housing instead of side. The bearings are $\frac{3}{4}$ in. diameter and $2\frac{1}{2}$ ins. long.

Camshaft housing.—Overhead, central. Horizontally divided along centre line of camshaft, allowing easy removal of shaft. A drain to main crankcase sump is provided at each end of housing.

impinges on and cools the former. A small portion of the carburettor air is also drawn through the crankcase.

Lubrication.—A gear pump delivers oil from the crankcase to a combined tank and cooler, from which it is drawn by a second gear pump and forced under a pressure of 40 to 90 lbs. to the crankshaft bearings, through the shaft, up the connecting rods to the small-end bearings, and thence to the cylinder walls. The camshaft and gear are lubricated by oil by-passed from the oil pressure regulator.

Ignition.—Two entirely independent magnetos supply the current, each cylinder having a pair of spark plugs. The magnetos are driven through a combined driving gear and floating coupling, no end or radial thrust being transmitted to the armature shaft or bearings.

Water pump.—Centrifugal type, driven in the same way as the magnetos, the gears, in fact, being interchangeable.

Petrol consumption.—10.5 gallons per hour (58° Baume).

Oil Consumption.—3 galls. per hour (35° Baume at 60° F. Wolfhead).

Dimensions.—Overall length, 5 ft. $5\frac{1}{2}$ ins.; overall width, 1 ft. 5 ins.; overall depth, 3 ft. $4\frac{3}{4}$ ins.; width at bed 1 ft. 5 ins.; height from bed, 2 ft. $4\frac{1}{4}$ ins.; depth from bed, 1 ft. 0 $\frac{1}{2}$ in.

The following is the report on the tests:—

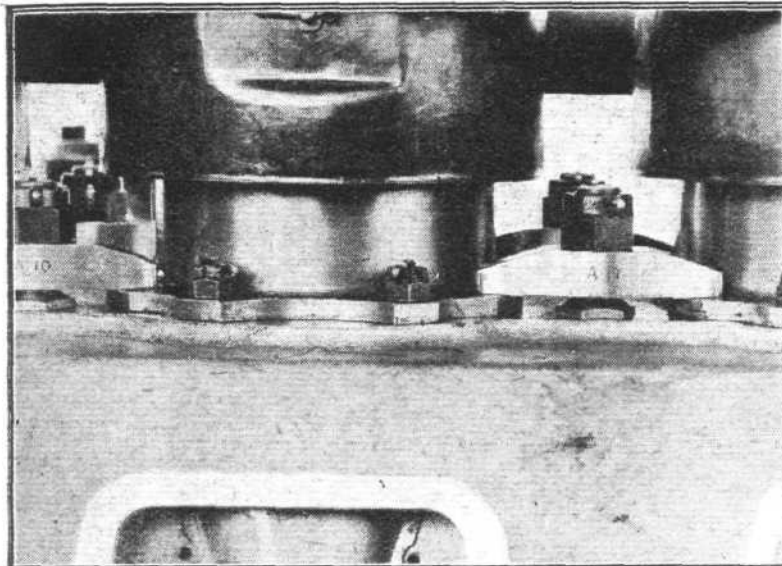
The test was performed at the Union Gas Engine Co.'s factory, Oakland, California, and consisted of 48 hours' running, made up of eight separate runs of 6 hours each on

consecutive days from May 10th to May 18th, inclusive. The engine was mounted on a torque cradle frame, similar in design to that used at the Navy Yard, Washington, D.C. The rated output of 120 h.p. at 1,350 r.p.m. was obtained with a pusher propeller.

The main test each day was started after a preliminary warm up of five minutes. Readings of all instruments were

were low, quick acceleration and good carburetion maintained, also the absence of oil leakage was another good feature, as well as no evidence of water leakage at any of the joints.

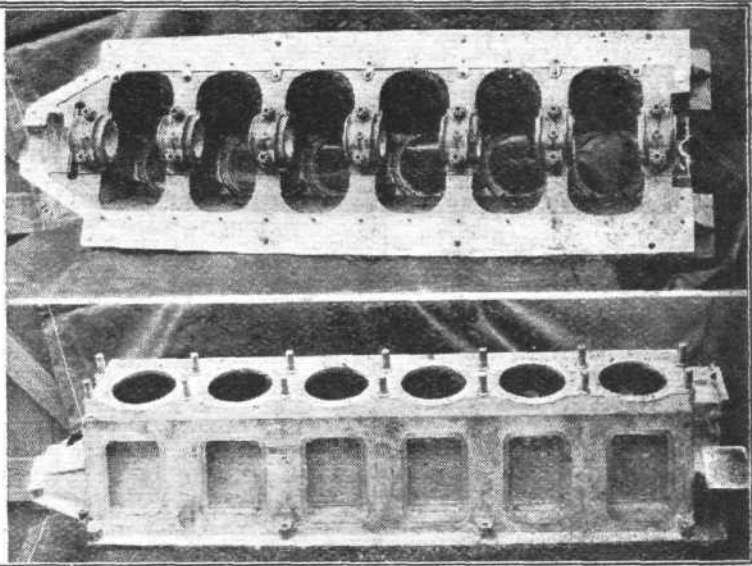
The maximum power developed was 123.5, while engine averaged 118 h.p. on last day, with an overall average of 120. Inspection of parts showed that with increase of



The 120 h.p. 6-cyl. Union Aero Engine.—The method of holding down the cylinders to the crankcase, whereby the latter is relieved of all tension. In addition to four small studs on each cylinder flange, long studs, holding at their lower ends the bearing caps, clamp down a pair of cylinders each, as shown.

taken every thirty minutes and the hourly average entered on the log sheet. The revolutions per minute were computed from the readings of a positive continuous counter, stepped down ten times, direct connected to the crankshaft. The torque was obtained from the readings of the spring balance scale, and the brake horse-power computed by the standard S.A.E. formula, using the previous noted readings.

The initial level of the petrol in the feed tank was marked on the gauge glass, and every half hour the fuel level was

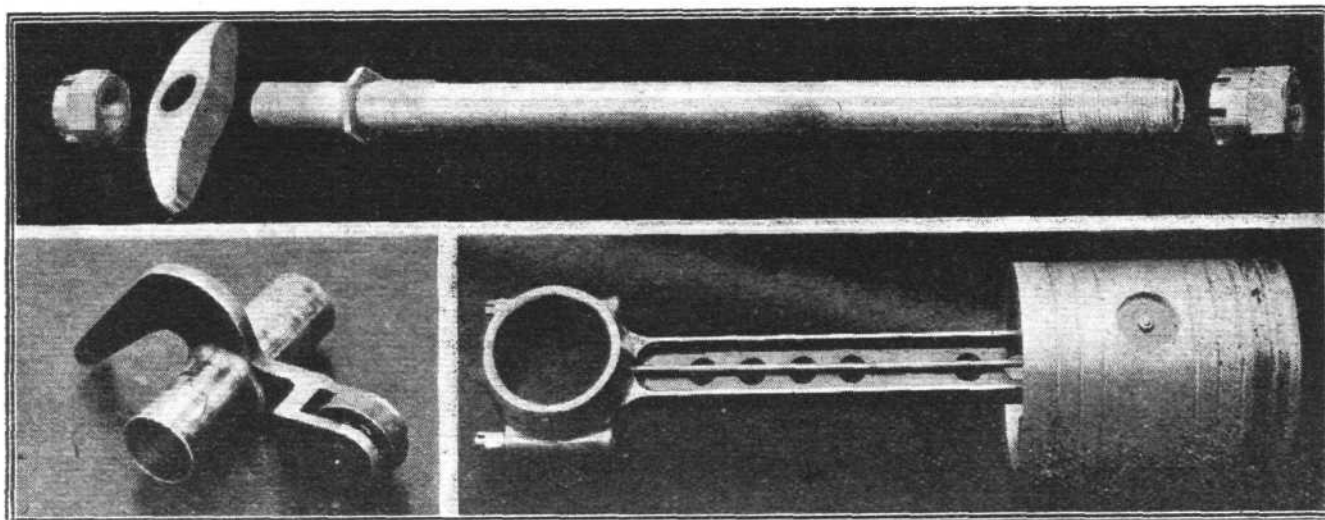


The 120 h.p. 6-cyl. Union Aero Engine.—Two views of the upper half of the crankcase, showing (top) the seven main bearings, and (bottom) the box section construction of the walls.

piston clearance a higher average could be expected as the friction horse-power was excessive, due to drag of two pistons (see piston inspection).

On the fourth day's test Zeroline Special with a gravity of 20° Baume was used during a portion of the test, showing that this engine would perform satisfactorily with lubricating oil varying from 20° to 30° Baume gravity. The average oil consumption was 0.27 gallon per hour, or 0.0124 lb. per horse-power hour, which is a good average figure.

The average petrol consumption was 10.7 gallons per hour, or 0.558 lb. per horse-power hour, while the overall



THE 120 H.P. 6-CYL. UNION AERO ENGINE.—At the top are shown the component parts of one of the cylinder studs. Below, on the left, one of the valve rockers, the arm of which projects out of the top of the camshaft housing, thus preventing oil leakage. On the right are shown a piston and connecting rods.

brought to this mark, the quantity necessary to accomplish this being weighed and entered on the log sheet. The summation of these represent the total consumption for the run. The oil consumption was obtained by weighing in the initial oil and weighing out that which remained in the tank at completion of each test.

The engine performed a very satisfactory endurance test. Observations throughout the test showed that the vibrations

thermal efficiency based on brake horse-power was 0.222. These figures show good carburetion.

The engine demonstrated that its design and construction were such that it would stand endurance test of a much longer duration, as when the run was stopped the engine was functioning very satisfactorily.

Summary of inspection.—The inspection of the engine after the 48-hour endurance test showed the fundamental design

RESULT SHEET OF 48-HOUR ENDURANCE TEST—UNION GAS ENGINE COMPANY.

Propeller pusher No. 1, Pitch 4 ft. 8 ins., diameter 8 ft. 1 in.

Date May	10th.	11th.	13th.	14th.	15th.	16th.	17th.	18th.	Average.
Run number	1	2	3	4	5	6	6	8	—
Duration hours	6	7	5	6	6	6	7	8	—
Pressures.									
Barometer in Hg.	30.30	30.10	30.26	30.20	30.23	30.28	30.18	30.18	30.21
Circulating water, lbs. sq. in.	—	—	—	7.5	7.5	7.	6.25	6.26	7.
Lubricating oil lbs. sq. in.	74.	80.	98.	100.	96.	94.	92.5	87.	90.
Temperatures (° F.).									
Outside air	62.	62.	59.	58.	58.	57.	58.	59.	58.
Circulating water, inlet ..	140.	146.	138.	140.	142.	142.	144.	143.	140.
Circulating water, outlet ..	155.5	126.	154.	158.	158.	158.	161.	159.	157.
Lubricating oil, final ..	101.	96.	98.	99.5	99.	94.	92.5	95.	95.
Gasoline.									
Standard oil of 58° Baume :									
Gallons hour	10.5	10.9	11.3	10.6	10.75	10.62	10.7	10.65	10.7
Lbs. .. h.p. hour	0.505	0.557	0.590	0.540	0.543	0.537	0.580	0.560	0.558
Oil.									
Wolfshead of 30° Baume :									
Gallons hour	0.25	0.64	0.40	0.21	0.25	0.20	0.30	0.33	0.27
Lbs. .. h.p. hour	0.015	0.038	0.024	0.0125	0.0148	0.0123	0.02	0.023	0.0124
Power.									
Revolutions per minute ..	1348.	1361.	1341.	1347.	1337.	1334.	1325.	1337.	1341.
Torque lbs. ft.	484.	473.	462.	478.	483.	468.	452.	468.	472.
Brake horse-power ..	123.5	122.5	118.	122.6	123.	118.7	114.	118.	120.
Overall thermal efficiency	0.249	0.220	0.213	0.228	0.227	0.213	0.210	0.220	0.222

to be such that satisfactory service would be given by this power plant, that the quality of the workmanship throughout was of a very high order, and also that the best of material had been used throughout the engine.

The above is substantiated by the following points :—

1. *Vibration.*—All nuts outside of those on the cylinder yoke hold-downs were not cotted on. These were not tightened during the test, and all of these were tight as much at the end as in the beginning of the test.

2. The engine parts were well lubricated and in good shape, and there was little evidence of undue wear. Although a high oil pressure of 90 to 100 lbs. was carried throughout the run, no serious oil leaks developed, and that from the camshaft around the rocker arms was practically negligible.

3. *Quality of workmanship.*—The crankshaft was set up fairly stiff, and at the end of the test this was checked up. Due to static friction, the crankshaft could not be revolved by applying pull on crankpin. Once, however, the shaft rotation was started by applying pull at a greater leverage, it could be kept revolving easily by mechanic exerting force on pins. This speaks well for workmanship in the initial alignment and fit in the bearings.

4. *Quality of aluminium castings.*—The wrist pins, rocker pin bearings, were machined in the aluminium castings and upon inspection the material was found to be of the highest quality.

5. The bearings throughout were in excellent condition. The scraping marks were still in evidence in crankshaft bearings, showing the load was well distributed and that high-grade bearing material was used.

6. The cylinders showed slight wear as the grinding marks were not obliterated. These were well lubricated. The valves were not warped, did not show excess heat indication, had good bearing surface, and the wear of the stems was slight. This shows good carburetion and good scavenging. Also, that compression was satisfactory was borne out by well worn surface of rings, small evidence of blowing by, and small deposit of carbon. The latter, together with absence of heat, shows the cooling of the cylinders and pistons was O.K.

7. The box-shaped upper crankcase gives rigidity and strength also. In casting the strain will tend to be equalised due to its special construction of compartments with connecting walls, thus, perhaps, ensuring a high quality of casting. The castings of other cases were inspected and bore out this conclusion, as the material was clean and of uniform density, taking into account that aluminium alloy was used.

8. The engine was easily and quickly disassembled.

Adjustments and alteration.—The only adjustments made during the test (between runs) were cleaning spark plugs and adjusting gaps to 0.018 in., and cleaning of distributor race-way of carbon deposit.

THE R.N.A.S. AND SUBMARINES.

SOME further striking episodes, taken from the Admiralty records, of successful attacks by R.N.A.S. aircraft on German submarines have been published as follows :—

"One of the coastal airships, of a type familiar to visitors at seaside resorts, was recently on patrol, and sighted a steamer in distress. On descending to investigate closer, it was found that she had been torpedoed by an enemy submarine, but was capable of being towed into harbour. Accordingly the airship summoned assistance by wireless, and until it arrived hovered protectingly round the crippled merchantman. No signs of her late assailant were visible, and in due course the steamer was taken in tow by tugs and headed for harbour. The aerial escort accompanied the tow, and about an hour later sighted the conning tower of a submarine about five miles to the south-eastward of the convoy, apparently manoeuvring for another shot.

"The airship instantly signalled by wireless the position of the submarine to all men-of-war in the vicinity, and swooped down to attack. The submarine saw her coming, and dived, but too late to avoid this glittering Nemesis from the skies. Two bombs were dropped simultaneously in front of the swirl of his descent; a violent explosion ensued, followed by oil and air bubbles in ominous quantities. Shortly after

a destroyer arrived and investigated with sweeps. The airship, returning to her base for a further supply of bombs and petrol, was overtaken by the following aerial signal : ' You've undoubtedly bagged him.'

"On a subsequent occasion this same airship, while flying in company with a west-bound convoy of merchantmen, sighted the track of a torpedo, and a moment later observed a great column of water shoot up alongside one of the steamers. A submarine, relying on the state of the sea for concealment, had with great daring dived beneath the armed escort and torpedoed her victim under their noses. The weather at the time was bad and rapidly getting worse; the airship shot down and along the residual track of the torpedo at a speed of 90 miles an hour, and at the end of the track sighted the outline of a submerged submarine, which, her deadly work done, was leisurely proceeding westward. The airship turned and released her bombs while she hovered above the sinister green cigar-shaped shadow, and the explosion was followed by a vast evulsion of air and air bubbles. A calcium flare was dropped to mark the spot, and armed patrol vessels, summoned by signal, made assurance doubly sure with explosive charges. The airship returned to her base in the teeth of a head gale, and landed with the wind blowing 45 miles per hour."

HONOURS.

Honours for the R.F.C.

It was announced on October 18th that His Majesty the King has been pleased to confer the following rewards for gallantry and distinguished service in the field. The acts of gallantry for which the decorations have been awarded will be announced as early as practicable :—

Bar to Military Cross.

- 2nd Lieut. L. M. BARLOW, M.C., R.F.A. (S.R.), attd. R.F.C. (M.C. gazetted August 25th, 1917).
 Lieut. (Temp. Capt.) C. F. COLLETT, M.C., R.F.C. (S.R.) and Gen. List (M.C. gazetted September 26th, 1917).
 Temp. Capt. P. J. V. LAVARACK, M.C., Gen. List and R.F.C. (M.C. gazetted May 25th, 1917).
 Temp. 2nd Lieut. (Temp. Capt.) E. MANNOCK, M.C., R.E. and R.F.C. (M.C. gazetted September 17th, 1917).
 2nd Lieut. (Temp. Capt.) D. F. STEVENSON, Yeo. and R.F.C. (M.C. gazetted September 17th, 1917).

Military Cross.

- Temp. Capt. R. N. G. ATKINSON, Gen. List and R.F.C.
 2nd Lieut. J. A. BORET, R.W. Surr. and R.F.C.
 Temp. 2nd Lieut. C. W. CUDEMOER, Gen. List and R.F.C.
 2nd Lieut. (Temp. Lieut.) J. DIAMOND, K.O.S.B. (S.R.) and R.F.C.
 Temp. 2nd Lieut. M. B. FREW, Gen. List and R.F.C.
 Temp. 2nd Lieut. R. E. G. FULLJAMES, Gen. List and R.F.C.
 Temp. Lieut. H. D. HARMAN, Gen. List and R.F.C.
 Lieut. S. B. HORN, D. Gds. and R.F.C.
 Temp. 2nd Lieut. H. A. JONES, attd. Wilts and R.F.C.
 Capt. G. J. C. MAXWELL, Yeo. and R.F.C.
 Temp. 2nd Lieut. K. K. MUSPRATT, Gen. List and R.F.C.
 2nd Lieut. A. C. T. PERKINS, R.G.A. (S.R.), attd. R.F.C.
 Temp. 2nd Lieut. W. M. PIERCE, Gen. List and R.F.C.
 Temp. 2nd Lieut. (Temp. Capt.) W. J. TEMPEST, D.S.O., Gen. List and R.F.C.
 2nd Lieut. (Temp. Lieut.) F. W. H. THOMAS, Yeo. and R.F.C.

- Capt. C. T. VACHELL, Mon. and R.F.C.
 2nd Lieut. (Temp. Lieut.) L. WALMSLEY, E. Yorks. and R.F.C.
 Temp. O. B. W. WILLS, R.F.C.
 2nd Lieut. F. WOODCOCK, R.G.A. (S.R.) and R.F.C.

Note.—All awards of the Distinguished Service Order and Military Cross, conferred by Commanders-in-Chief in the field and notified to War Office up to September 30th, have now been announced.

The King has been pleased to award the Military Medal for bravery in the field to the following :—

- 7443 1st Air-Mech. F. A. BISCOE, R.F.C.
 47936 2nd Air-Mech. W. HEWITT, R.F.C.
 8009 1st Air-Mech. R. JOHNSON, R.F.C.
 50104 2nd Air-Mech. J. THOMAS, R.F.C.

The King has been pleased to award the Distinguished Conduct Medal to the following :—

- 7769 1st Air-Mech. A. W. CANT, R.F.C.
 4965 1st Air-Mech. S. HALL, R.F.C.
 3116 Sergt. W. E. SMITH, R.F.C.
 48027 Par. W. T. SMITH, R.E., attd. R.F.C.
 4400 Sgt. R. G. TAYLOR, R.F.C.

Brave Nurses Rewarded.

It was announced on October 17th that the King had been pleased to award the Military Medal to the following ladies for conspicuous gallantry displayed in the performance of their duties on the occasion of hostile air raids on casualty clearing stations in the field :—

Acting Sister Ellen Byrne, Q.A.I.M.N.S. (R.) ; Staff Nurse Elizabeth Jane Eckett, T.F. Nursing Service ; Sister Winnieford Muriel Hawkins, T.F. Nursing Service ; Sister Alicia Mary Kelly, Aust. Army Nursing Service ; Sister Rachel Pratt, Aust. A.M. Corps ; Acting Sister Catherine Murray Roy, Q.A.I.M.N.S. ; Sister Minnie Wood, Q.A.I.M.N.S.



Mr. Bonar Law on Air War.

SPEAKING at the meeting at the Albert Hall on October 23rd, in connection with the new economy campaign, Mr. Bonar Law, after referring to the failure of the German submarine campaign, said :—

"They have another hope. They hope to win by warfare from the air on defenceless women and children. But they have not succeeded so far, and they will not succeed. To read the papers sometimes, one would think members of Governments were quite different from other people. We are not. We share your feelings and, if you like, we share your prejudices. The Government realises the importance of the air service ; not merely now, but for many, many months it has had priority over any other form of supply, as the result has shown. The members of the Government received a report the other day—I have not asked the permission of the military authorities to make it public, but I do not think it will do any harm, and I will risk it. During last month our air service at the front, among their other activities, dropped about 8,000 bombs behind the German lines. In the same period the Germans dropped about 1,000 bombs behind our lines. In the month of September, again, our air service directed the artillery on something like 8,000 batteries of the enemy, and they directed it against between 700 and 800 of our batteries. I venture to say to you, therefore, that from the point of view of damage inflicted on the enemy what was done against them by us in September far exceeded all the damage that in all their air raids they have inflicted upon the people of England.

But that is not enough. We share your feelings. You know that we cannot prevent these air raids, but it is our business to make them as costly as possible. But I think I know that the people of this country can bear hardships and dangers of death that may come more patiently, and rightly so, if they know that they are not all on one side. I wish to be careful in what I say. We are not going to lose our air supremacy on our front in Flanders ; we do not intend to tell the enemy what we propose to do ; we do not desire to boast or to raise false anticipations—but I say this, it is a kind of warfare which is detestable, we would avoid it if we could, but our enemy has determined on it ; so be it. It was not we who started poison gas—we should never have done it—but it is not by our enemy, it is by us and our Allies that that weapon is being used most effectively to-day. It is the same

here. Let our enemy have patience, and he will find that what he can give us will be returned in full measure, pressed down, and running over."

French Tribute to Captain Guynemer.

THE last mention of Capt. Guynemer by General Anthoine in Army Orders was as follows :—

"General Commanding Army mentions Capt. Guynemer, commanding No. 3 Squadron, in General Orders of the Army.

"Capt. Guynemer died on the field of honour on September 11th, a hero of legend, who fell from the high heaven of glory after three years of ardent conflict.

"He will be remembered as the perfect symbol of the highest qualities of our race. He showed indomitable tenacity, fierce energy, and blind courage. He was animated by the firmest faith in victory, and he has bequeathed to every French soldier an imperishable memory, which will stimulate a spirit of self-sacrifice and the noblest emulation."

The Chamber has decided by a unanimous vote to place the name of Capt. Guynemer on the commemorative tablets of the Panthéon until his body can be found and buried in that famous hall.

French Pilots Honoured.

GOLD medals have been presented by the Aero Club of France to Capt. Personne and Sub-Lieuts. Ortoli, Noel, and Coupot.

Sub-Lieut. Louis Noel, who is none other than the popular Hendon pilot, has a magnificent record, including raids on Bucharest from Salonica, is the holder also of the Cross of the Legion of Honour, the Military Medal, and the Russian Cross of St. George.

Chemet Drowned in Escaping from Germany.

It was announced in Paris last week that Chemet, who had become well known before the war as a waterplane pilot, had been drowned in the Rhine in attempting to escape from Germany in company with a friend taken prisoner on the French front. He was interned at Dillingen, Bavaria. At the end of about ten days he escaped, and, after a tramp of 75 miles across Southern Germany, passed into Austria, near Bregenz. He then had to traverse the Rhine to the south of Lake Constance to reach Switzerland. Not being able to swim, Chemet, although provided with a swimming apparatus, was unable to battle against the strong current of the river, and being carried away by it was drowned.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

HOUSE COMMITTEE.

A MEETING of the House Committee was held on Monday last, the 22nd inst., when there were present:—Mr. J. H. Nicholson, in the Chair, Mr. C. G. Greenhill, Mr. Henry Knox, Mr. J. Stewart Mallam and the Secretary.

House Accounts.—Profit and Loss Accounts for the months of July, August and September were submitted, which showed that the House Finances were satisfactory.

Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	..	5s. each per night.
Breakfast	2s. 6d.
House Luncheon	2s. 6d.
House Dinner	3s. 6d.

Billiard Room.

The Billiard Room is now open for the use of the Members.

THE FLYING SERVICES FUND.

administered by

THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions. £ s. d.

Total subscriptions received to Oct. 23rd, 1917.. 12,458 17 7

H. E. PERRIN, Secretary.

3, Clifford Street, New Bond Street, W. 1.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Previously Missing, now reported Killed.

Obs. Sub-Lieut. C. L. Haines, R.N.

Previously Missing, now presumed Killed.

Fight Sub-Lieut. C. R. W. Hodges, R.N.

Wounded.

Flight Sub-Lieut. A. J. Binks, R.N.

Flight Sub-Lieut. I. F. Sutherland, R.N.

Accidentally Injured.

Flight Sub-Lieut. A. C. Campbell-Orde, R.N.

Flight Sub-Lieut. G. Towers, R.N.

Flight Lieut. A. M. Waistell, R.N.

Missing.

Flight Sub-Lieut. W. E. B. Oakley, R.N.

Previously Missing, now reported Prisoner of War.

Flight Sub-Lieut. R. E. McMillan, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. E. D. Gibson, R.F.C.

Lieut. H. G. Holt, M.C., R.F.C.

2nd Lieut. A. J. D. Torry, M.C., R.G.A., attd. R.F.C.

2nd Lieut. G. H. Knight, R.F.C.

2nd Lieut. H. W. Laird, R.F.C.

2nd Lieut. E. P. Lewis, R.F.C.

Capt. J. I. MacKay, D. of Well., attd. R.F.C.

2nd Lieut. Z. S. Marsh, R.F.C.

2nd Lieut. C. F. K. Pierson, R.F.C.

2nd Lieut. V. S. Smith, R.F.A., attd. R.F.C.

2nd Lieut. A. A. Steward, R.F.A., attd. R.F.C.

2nd Lieut. J. R. Tyrer, Manch., attd. R.F.C.

2nd Lieut. L. C. Wates, R.F.C.

69279 3rd Air-Mech. U. Cox, R.F.C.

65309 1st Air-Mech. N. Friend, R.F.C.

7470 1st Air-Mech. C. N. K. Hogg, R.F.C.

P/305201 2nd Air-Mech. C. Loveland, R.F.C.

Previously Missing, now reported Killed.

Capt. W. A. Bond, M.C., K.O. (Yorks L.I.), attd. R.F.C.

2nd Lieut. H. C. Clarke, D.C.L.I., attd. R.F.C.

2nd Lieut. H. N. Curtis, R.F.C.

2nd Lieut. C. C. Dennis, London R., attd. R.F.C.

2nd Lieut. W. C. Fenwick, R.F.C.

2nd Lieut. W. J. Gayner, Som. L.I., attd. R.F.C.

2nd Lieut. R. Hayes, R.F.C.

Lieut. D. J. Honer, R.F.A., attd. R.F.C.

Capt. A. Jennings, R.F.A., attd. R.F.C.

Lieut. A. W. B. Miller, K.O.S.B., attd. R.F.C.

2nd Lieut. E. J. Roberts, R.F.C.

Capt. C. E. Robertson, R.F.C.

2nd Lieut. F. Roux, R.F.C.

Lieut. H. Welch, R.F.A. and R.F.C.

Previously Missing, now reported by the German Government Killed or Died of Wounds.

28707 2nd Air-Mech. J. C. Walker, R.F.C.

Died of Wounds.

2nd Lieut. E. Armitage, R.F.C.

2nd Lieut. J. T. Long, R.F.C.

2nd Lieut. G. F. Sogno, Sussex, attd. R.F.C.

Lieut. E. R. Wilkinson, M.C., R.F.C.

8696 2nd Air-Mech. W. Fairclough, R.F.C.

77648 2nd Air-Mech. F. Farmer, R.F.C.

22580 2nd Air-Mech. F. Hellier, R.F.C.

42899 2nd Air-Mech. A. E. Wood, R.F.C.

Died.

65535 1st Air-Mech. E. L. Abbott, R.F.C.

45171 2nd Air-Mech. W. H. Mansell, R.F.C.

Previously Missing, now reported Died.

Lieut. P. B. McNilly, Alta, attd. R.F.C.

Previously Missing, now reported Died of Wounds as Prisoner in German hands.

2nd Lieut. F. Higginbottom, Ches. R., attd. R.F.C.

Previously Prisoners, now reported Died of Wounds as Prisoners in German hands.

2nd Lieut. H. S. Richards, Sher. For., attd. R.F.C.

Lieut. H. D. Tapp, R.E., attd. R.F.C.

Accidentally Killed.

18729 1st Air-Mech. L. K. M. Bailey, R.F.C.

Wounded.

2nd Lieut. D. Alexander, R.F.C.

2nd Lieut. E. S. Dowdall, London, attd. R.F.C.

Lieut. W. F. Findlay, R.F.C.

2nd Lieut. G. C. Gardener, R.Ir.R., attd. R.F.C.

2nd Lieut. T. L. Gitsham, R.F.C.

2nd Lieut. J. E. Johnston, Cycle B., attd. R.F.C.

2nd Lieut. H. E. Jones, R.F.C.

2nd Lieut. W. G. C. Hackman, Hamp., attd. R.F.C.

2nd Lieut. C. W. Hamilton, R.F.C.

2nd Lieut. E. A. R. Hills, R.F.C.

2nd Lieut. W. G. Kewley, R.F.C.

Lieut. D. F. Lepraik, MdLx., attd. R.F.C.

Lieut. C. W. MacAloney, Nov. Scot., attd. R.F.C.

2nd Lieut. G. C. McGregor, R.F.C.

2nd Lieut. R. S. V. Morris, R.F.C.

Capt. W. V. T. Rooper, Yeo., attd. R.F.C.

2nd Lieut. D. E. B. K. Shipwright, R.F.C.

Lieut. R. I. Van-der-Byl, Brit. Col., attd. R.F.C.

Lieut. N. W. Wadham, Rif. Bge., attd. R.F.C.

2nd Lieut. G. B. Wigle, R.F.C.

Unless otherwise mentioned, the following are Air-Mechanics in the R.F.C., the figure in brackets giving their grade: 13488 (2nd) E. G. Casserley; 43267 (2nd) J. Fraser; 44363 (2nd)

A. J. Henley; 7502 (1st) B. F. V. Mariner; 9519 Corpl. E. Mitchell; 44266 (2nd) H. L. Neal; 59822 (2nd) F. H. Pierson; 9711 (2nd) W. G. Seward; 10220 (1st) W. E. Lister, R.F.C., attd. R.G.A.; 10700 (2nd) R. Peacock, R.F.C., attd. R.G.A.; 30495 Corpl. F. Clarkson; 57765 (2nd) A. L. W. Fox; 29730 (2nd) D. McBain; 8976 (1st) A. E. Cowling; 5711 (1st) H. J. Martin; 17833 (2nd) H. R. Chippendale; 68331 (2nd) H. Drinkall; 82873 (2nd) S. Lilley; 78602 (1st) S. Ottey; 55436 (2nd) J. C. M. West.

Previously Missing, now reported Wounded and Prisoners in German hands.

2nd Lieut. W. English, R.F.C.
2nd Lieut. F. L. Wheeler, R.F.C.

Missing.

Lieut. H. C. Ainger, R. Scots, attd. R.F.C.
Lieut. M. G. Begg, M.C., R. Bde., attd. R.F.C.
2nd Lieut. F. H. Berry, R. Scots, attd. R.F.C.
2nd Lieut. F. T. Brasington, R.F.C.
Lieut. J. C. Bush, M.C., Dorset, attd. R.F.C.
2nd Lieut. C. E. Carroll, R.G.A., attd. R.F.C.
Lieut. W. D. Chambers, Can. A.S.C., attd. R.F.C.
Lieut. W. W. Chapman, E. Kents, attd. R.F.C.
Lieut. J. Diamond, M.C., K.O.S.B., attd. R.F.C.
2nd Lieut. A. W. Edwards, R.F.C.
2nd Lieut. J. J. Fitzgerald, R.F.C.
Lieut. R. F. Hill, A.S.C., attd. R.F.C.
Lieut. R. I. V. Hill, Welsh, attd. R.F.C.
Lieut. C. H. Jeffs, Border, attd. R.F.C.

Lieut. G. R. Long, Manlt., attd. R.F.C.
2nd Lieut. I. V. MacMurchy, R.F.C.
2nd Lieut. M. A. Peacock, R.F.C.
Capt. J. R. Philpott, M.C., R.F.C.
Lieut. D. G. Powell, S. Wales Bord., attd. R.F.C.
2nd Lieut. R. H. Richardson, R.F.C.
2nd Lieut. J. G. Stevenson, R.F.C.
Lieut. I. L. Stockhausen, B.W. Ind. R., attd. R.F.C.
Capt. D. D. Walrond-Skinner, Mon., attd. R.F.C.
2nd Lieut. C. B. Wattson, R.F.C.
2nd Lieut. G. M. Wilkinson, D.C.L.I., attd. R.F.C.
1384 Sergt. S. Edgington, R.F.C.
6161 Corpl. J. H. Hamer, R.F.C.
5788 Actg.-Sergt. W. H. Roebuck, R.F.C.

Previously Missing, now reported Prisoners in German hands.

2nd Lieut. C. P. Adamson, R.F.C.
2nd Lieut. E. H. Garland, R.F.C.
Capt. C. G. Guy, North'd R., attd. R.F.C.
Capt. A. R. Hudson, Yeo., attd. R.F.C.
Lieut. J. A. Manners-Smith, R.G.A., attd. R.F.C.
2nd Lieut. A. H. Skinner, R.F.C.
2nd Lieut. G. M. Smith, A.S.C., attd. R.F.C.
2nd Lieut. S. Thompson, R.F.C.
Lieut. D. S. Wilkinson, R.F.C.

Previously Missing, now reported Prisoner in Bulgarian hands.

Lieut. E. N. Baillon, Brit. Col., attd. R.F.C.



ANSWERS TO CORRESPONDENTS

[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—Ed.]

F. A. B. (Horsham).—The reasons why an airship may under given conditions, be able to reach a greater height than a given aeroplane, are to be found in the difference of the fundamental principles of the two types of craft. It should not be presumed, however, as you appear to do, that any airship can always ascend to greater altitudes than any given aeroplane. This is very far from being the case, and it may be taken as a general rule that the best of aeroplanes—by best, in this connection, we mean aeroplanes designed to reach a great altitude—can always reach heights exceeding those attainable by the best of airships. To return to the difference in conditions. The airship relies for its lift, not on its engine power, but on the amount of air displaced by its gas bags. If therefore the airship be so designed that its weight is small in comparison with its cubic capacity—in other words, so that it has an excess of lift—it will obviously be capable of rising. The altitude to which it can rise will depend upon the magnitude of the excess of lift. As the altitude above sea level increases the density of the air decreases until at about 20,000 feet, a cubic foot of air weighs only half as much as a cubic foot of air at sea level. This decrease in the weight of the air displaced by the airship's gasbag therefore limits the height to which the ship can ascend.

In the case of the aeroplane this machine depends for its lift on the forward speed, which is obtained at the cost of engine power. The lift of the wings is governed, in addition to the question of speed, by the density of the air—that is to say, for a given speed and angle of incidence, the lift will only be half of the lift at sea level. Further, the power of the engine drops off in practically the same ratio as the lift owing to the decrease in density. That this is so will be easily realised when it is pointed out that as the density decreases the engine sucks in a smaller mass of air. The volume is the same, but the weight varies. Now, in order to keep the explosive mixture right the petrol supply has to be reduced to suit the smaller weight of air—hence a smaller amount, by weight, of explosive mixture is exploded in each of the engine's cylinders, and the power is consequently reduced, unless the power can be kept up by, for instance, forced induction.

A. M. (Streatham).—Cast iron is not a very good conductor of heat, and this fact is one of the causes of the diffi-

culty of cooling effectively engines with stationary cylinders. A considerable amount of experimenting with other materials, such as, for instance, aluminium alloys, has been done with, we believe, a fair amount of success. Copper, although being an excellent conductor, is not suitable for cylinders. Joining fins of one metal, such as aluminium or copper, on to cylinders of another metal, as steel or cast iron, has also been tried, but there is some considerable difficulty in making a satisfactory joint between the two surfaces.

C. A. B. (Woking).—The loading per sq. ft. of wing area of a single seater fighting biplane varies somewhat with the different makes of machines. Generally speaking, the loading is from 6 to 7 lbs. per sq. ft. The question of landing speeds is an important factor in deciding the loading. The majority of the wing sections used for machines of this type have maximum lift coefficients of such a magnitude that much greater loading than 7 lbs per sq. ft. will give so high landing speeds as to render the machine difficult to land safely except in the hands of the most experienced pilots.

D. E. S. (Golders Green).—The stream-line fuselage with rounded sides as well as top and bottom undoubtedly offers smaller resistance than the flat-sided fuselage. How great the difference is we cannot say, as this can only be determined by wind tunnel tests. For very fast machines, where the body resistance forms such a large percentage of the total resistance it would undoubtedly be a considerable advantage to employ a stream-line body, but for such low velocities as you contemplate it might not be worth while, considering the extra weight and cost.

G. E. P. (Boston).—So far as we know, the record for the lowest powered aeroplane to fly with pilot on board is held by Mr. A. V. Roe, who succeeded in making flights on his early triplane with an engine of only 9 to 10 h.p. To the best of our knowledge no machine has ever been flown in which the motive power was provided by storage batteries and electric motors. The weight of a power plant of this description would be altogether too great for the power developed. The letters S.E. in connection with a certain class of R.A.F. machines indicate Scouting Experimental.

E. B. (S. Norwood).—Of the three sets of sketches only the lower one is sufficiently clear to enable us to identify the machine. This is an F.E.

L. M. M. (W. Horsham).—(1) Judging from your sketch this machine is a B.E. 12a. (2) R.E.7 or R.E.8. Your last query we are not at liberty to answer.

"X" AIRCRAFT RAIDS.

IN view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X" 80 Raid (October 19th).

THE following *communiqué* from the Field-Marshal Commanding-in-Chief, Home Forces, states:—

"October 20th, 12.20 a.m.

"Hostile airships attacked the Eastern and North-Eastern Counties this evening. The enemy aircraft proceeded some distance inland over these counties, but did not carry out any very definite attack. Six or seven raiders took part in the raid. Bombs have been dropped at various points, including a few in the London area. The raid is still in progress."

"October 20th, 12.30 p.m.

"The latest police reports show that in last night's airship raid the following casualties occurred in all districts visited by the raiders: Killed, 27; injured, 53. Some material damage was caused to house property and business premises."

"Press Bureau, Oct. 23rd.

"The total casualties which occurred in all districts visited by raiding airships on Friday night amounted to: Killed, 34; injured, 56."

THE following *communiqué* was issued in Paris on the morning of October 21st:—

"During the night of October 19th-20th a certain number of Zeppelins flew over French territory without doing any damage. Shelled in their flight by our anti-aircraft defensive posts, several of the dispersed airships were brought down, or were forced to land.

"The first Zeppelin was brought down in flames at St. Clement, ten kilomètres (6½ miles) south-east of Lunéville.

"The second on being attacked by our aeroplanes had to land near Bourbonne-les-Bains. The crew were taken prisoners. The airship is undamaged.

"Two other disabled Zeppelins, attacked by our aeroplanes and defensive posts, came down in the valley of the Saone, and were forced to land in the region of Sisteron. The crews, after setting fire to the airships, attempted to take to flight, but were made prisoners."

The news was held back in Germany but the following *communiqué* was received in Amsterdam from Berlin on Monday:—

"The Admiralty Staff announces that during the night of October 19th-20th a naval airship squadron (under Captain Baron Preusch von Buttler-Brandenfels) attacked with special success London, Manchester, Birmingham, Nottingham, Derby, Lowestoft, Hull, Grimsby, Norwich and Mappleton. On the return journey, owing to an adverse wind and a dense mist, four airships (under Captains Habbert, Koolle, Hans Geyer, and Schwander) came over the French battle-zone, where they, according to the French, were shot down or forced down. No details regarding the fate of the vessels and their crews are available at present."

According to Dutch reports eight Zeppelins were seen to make the westward journey, but only three were seen straggling back, two passing over Holland, where they were fired on by Dutch gunners.

Four are definitely known to have been brought down in France, one was seen drifting almost vertically over the Mediterranean, while others were observed apparently in difficulties, but nothing definite is known as to their end.

According to the crew of the L 49 and L 50, the expedition consisted of twelve airships starting from three points, and when they reached the English coast they were bothered by the guns and searchlights. In order to go higher they dropped their bombs, but they were then caught by a strong

north-west wind. The cold was intense, and the pilots could not take their bearings. The men were frostbitten, despite their warm clothing and the motors froze. This is borne out by the fact that the boot of one of the crew of the L 44, which fell in flames at St. Clement, was surrounded by a mass of ice. Ultimately, when dawn broke the captain thought he was over either Holland or Westphalia. In different parts of an eastern county in England, five aluminium tanks, each of 60-80 gallons capacity, have been found, while another piece of Zeppelin has been picked up in a north-eastern county.

Details of the happenings during Saturday last to the various airships which appeared over France, as far as can be gathered, are as follows:—

L 44, which fell in flames at 6.45 a.m. at St. Clement, near Lunéville, was totally destroyed and all the crew are dead. It was brought down by semi-stationary section No. 174 D.C.A. under the command of Lieut. Fenouille and Sub-Lieut. Curie. The airship, with two others was first attacked at 4,000 metres when flying against a wind of 11 to 13 m.p.h., and then went up to 5,500 metres. It was bombarded again, and the fourth tracer shell set it on fire. One of the gondolas fell 100 yards from the main wreckage. The following are given by a correspondent of the *Liberte* as the dimensions of the airship: Length, 177 metres (580 feet); width, 20 metres (65 feet); capacity, 30,000 cubic metres (100,000 cubic feet); four 200 h.p. Mercedes engines; radius of action, 800 km. (500 miles); ascent limit, 6,000 metres (19,680 feet); explosive charge, 11,500 kilos.; armament six machine guns, two on the superstructure.

The L 49 which landed at 10 a.m. at Bourbonne-les-Bains, about 45 miles south-east of Epinal, was captured intact, and the two officers and seventeen men were made prisoners. Forced to land by five aeroplanes of squadron No. 152, the crew attempted to set fire to it, but this was frustrated by the promptitude of the aeroplane pilots, who came down close by the airship. This vessel—and also the L 50—is stated to be 644 feet in length, with a capacity of 215,765 cubic feet. It had four cars, and was covered with black canvas.

The L 45, which fell at Mison, near Gap, at 10.30 a.m., had started from Tondern, Schleswig-Holstein. On its return, running short of petrol, it drifted along the valley of the Saone and over Lyons, finally falling in the bed of a stream called La Buec. Two officers and fifteen men were captured. The crew set fire to the envelope, but the barograph showed the greatest height as 6,200 metres (20,336 feet). This airship was 200 metres (656 feet) in length, and had three motors.

The L 50 came down at Dammartin, near Montigny-le-Roi at 11 a.m. A gondola was either torn off by a tree or cut away by the crew. Two officers and fourteen men were landed, enabling the airship to rise again with four men, but it is believed that the airship was practically disabled. According to a prisoner this vessel left Oldenburg at 2 p.m. on Friday for London, but lost its way in a fog over Norwich, and endeavoured to steer for home.

Another Zeppelin, the number of which has not yet been announced, came down between Sisteron and Gap at 4 p.m., and the crew immediately set fire to the airship. Five officers and fifteen men were taken prisoners.

Two other Zeppelins were reported to be apparently drifting helplessly over the Gap district during Saturday afternoon, but nothing definite is known as to their fate. It is possible it was one of these which was seen crossing the frontier into Switzerland near Pontarlier. About 4 p.m. an airship (possibly one of the above) was sighted at Frejus, Toulon, and other places. Aeroplanes went up in pursuit, but the airship was lost sight of at 5 p.m., by which time it was in an almost vertical position and drifting south-east over the Mediterranean.

Compensation for Air Raid Damage.

At a conference of Mayors of Metropolitan Boroughs on October 16th, Mr Hayes Fisher outlined the measures which have been taken for the alleviation of distress caused by air raids. He stated that the local committees had been authorised to grant immediate relief up to an amount equivalent to the amount of Army separation allowances and in special cases to make supplementary allowances. They had also been authorised to defray the funeral expenses of victims of the raids; to make special grants for medical or surgical

treatment; and to replace essential articles of furniture and clothing. He suggested that each local authority should have its organisation in readiness before hand, and indicated the nature of the arrangements which might be made for the provision of temporary shelter or food and other necessary relief immediately after a raid. Mr Hayes Fisher also pointed out that in addition to the relief of temporary distress provision had been made by the Government for grants from public funds on the lines of the Workmen's Compensation Act in cases in which personal injury had resulted in death or permanent disablement.

PARIS TO LONDON BY AIR.

By DOUGLAS W. THORBURN.

If you have been staying long in Paris the police ask you to give them ten days' notice when you want to leave. This is all very well if you are not in a hurry, and Paris, even under present conditions, is sufficiently amusing for another ten days to be no great hardship, but *les affaires sont les affaires*, and it was necessary for me to get back to Wakefield House at once. By good fortune an old friend was over there for a few days, having flown over to give demonstrations on one of the latest and best productions of the British aircraft industry. I thought I saw a chance.

With that excessive modesty for which he has always been famous, and which was at one time the despair of his pre-war press agent, he has asked me not to mention his name, so I may as well follow the example of the entertaining individual who invented algebra, and call him "X." That is not really his name, but it is near enough. I might add that he has probably done as much flying, if not more, than anyone else in this country, which is saying a good deal.

Anyway, he was returning by air the following day and agreed to find room for my luggage and myself. The weather was fine, and we motored out to Versailles for an early lunch, accompanied by a small but distinguished party of friends who wished to be present at the start. The aircraft industries of France, Italy and America were well represented, and so excellent was the lunch that it was after three before we reached the aerodrome at Buc. Having stowed numerous suitcases, canes and umbrellas into our machine, and stuffed much cotton wool into our four ears, X gave the signal and we started on our flight to Hendon.

A cross-country trip on a machine doing well over two miles a minute is quite a good lesson in geography. X was busy watching his various instruments and studying a wonderful collection of maps arranged in sections. We dashed across the centre of Paris, the Eiffel Tower, as is usual from a height, looking comparatively insignificant, while the church on the summit of Montmartre shone conspicuously white in the sun, and were soon well on our way towards Amiens and Calais. We kept somewhere between 1,500 and 2,000 feet, and the country looked charming and interesting. As we got further north, however, the air began to get misty. Our compass had run down or wanted cleaning or something, and was behaving in a most misleading manner, and when we ought to have been at Calais we were not. Eventually we found a deserted stretch of coast-line, and having followed it for some distance, came to a sea-port. X saw an aerodrome and descended to enquire where we were. It was a Belgian air station, and officers informed us we were at Calais. They pointed out the direction of Folkestone, and we started again.

On that particular machine we ought to have been across the Channel in eight minutes, at the most, but the dense mist concealed both land and sea, and we saw nothing at all for twenty minutes. By this time I had a strong suspicion we were lost, and my relief was great when suddenly another seaport became visible underneath our nose. It seemed a busy and interesting place, and I was leaning over to get a better view when, to my amazement, X did a rapid banked turn and made off in the opposite direction as hard as he could go. I was completely puzzled until I learned later on that this was Dunkirk and that we were heading straight for Ostend! Now that I am comfortably settled in my own arm-chair I can afford to smile at the thought of the welcome we would have had if we had kept on going.

Another distraction, however, was now awaiting us. I had naturally guessed that we were getting into a dangerous neighbourhood, and began to scan the sky carefully for other aircraft, and my efforts were soon rewarded. We were by this time about 4,500 feet up, when I caught sight of an unmistakable Hun 5,000 or 6,000 feet above us. I

waggled the joystick violently (the dual control fortunately gave me a means of communication) attracted the attention of X, but he was unable to see the Hun from his seat between the planes, and after one or two efforts to find out what I was pointing to he appeared to lose interest in the matter. We had excellent gun mountings but no guns. If the Boche had been underneath I might have dropped a suit-case on him, (one belonging to X for choice) but umbrellas and things are not much use as weapons of defence against an enemy about a mile higher up. The horrid-looking object was descending at an unpleasant rate directly on to us, so I waggled the joystick still more vigorously until X realised something was happening. When he caught a glimpse of the Boche he lost no time in putting the nose of our "bus" downward into the mist and with the greatest joy I watched my speed-indicator spin round as we left our enemy behind. When it was all over, I thoroughly enjoyed the intense thrill of that little episode, but it was some minutes before I could get over the feeling that something was going to hit me hard at the back of the neck.

By this time I had lost all sense of direction. We came down to 1,000 feet, and soon discovered another piece of sea-shore which to me looked English. We followed it and came to a town surrounded by camps, which I concluded must be Folkestone at last. The wish, however, was only father to the thought, for a closer inspection revealed the fact that several factory buildings had French names painted on the roofs and in a few minutes we were back in the Belgian aerodrome at Calais!

This time we attracted quite a lot of attention. One officer came alongside as we landed, saluted me impressively, and said, "Pardon, m'sieur, je crois c'est le lieutenant Petrovsky, n'est ce pas l'aviation Russe?" I could not resist the temptation to reply, "Oui, in sieur-comment ça va?" He at once shook hands most cordially and said many pleasant things, but my supply of French was quickly exhausted and I had to confess that I was not the officer in question. Wrapped up in flying kit as I was I might easily have been Petrovsky or Richthofen or even Grahame-White, except of course that Grahame-White has no moustache.

X decided that the Channel mist was getting thicker, and as our motor was not giving its full h.p., it was advisable to spend the night in Calais. There was another aerodrome not far away so we flew over there and left the machine in charge of mechanics. We had a very lively night, thanks partly to Boche aeroplanes which came over in a most unfriendly spirit, and partly to a loud siren which wailed plaintively at intervals nearly all night to prevent us dropping off to sleep before the raid was over. No silent policemen on bicycles for Calais.

Next morning the atmosphere was better, and we established an entirely new record in the annals of aviation. We made a non-stop flight from Calais to Hendon and arrived five minutes before we started! This may sound improbable, even in these days of fast machines, but it is nevertheless a fact that we left Calais at 11.15 and reached Hendon at 11.10. Of course, the difference then existing between French and English time may have had something to do with it, but in any case I think the performance was surely a record.

X is a great pilot, and I don't care who knows it. I shall always be indebted to him for enabling me to avoid that terribly tedious trip via Havre and Southampton, with all its irritating formalities and delays. It has since taken me the better part of a day to straighten matters out with the Foreign Office and the Controller of Military Permits, for according to my passport I was still officially in France, and an unprecedented situation had arisen. However, all is now clear, and my passport has been specially endorsed, for all the world as though it were a motor license—presumably for exceeding the diplomatic speed limit.



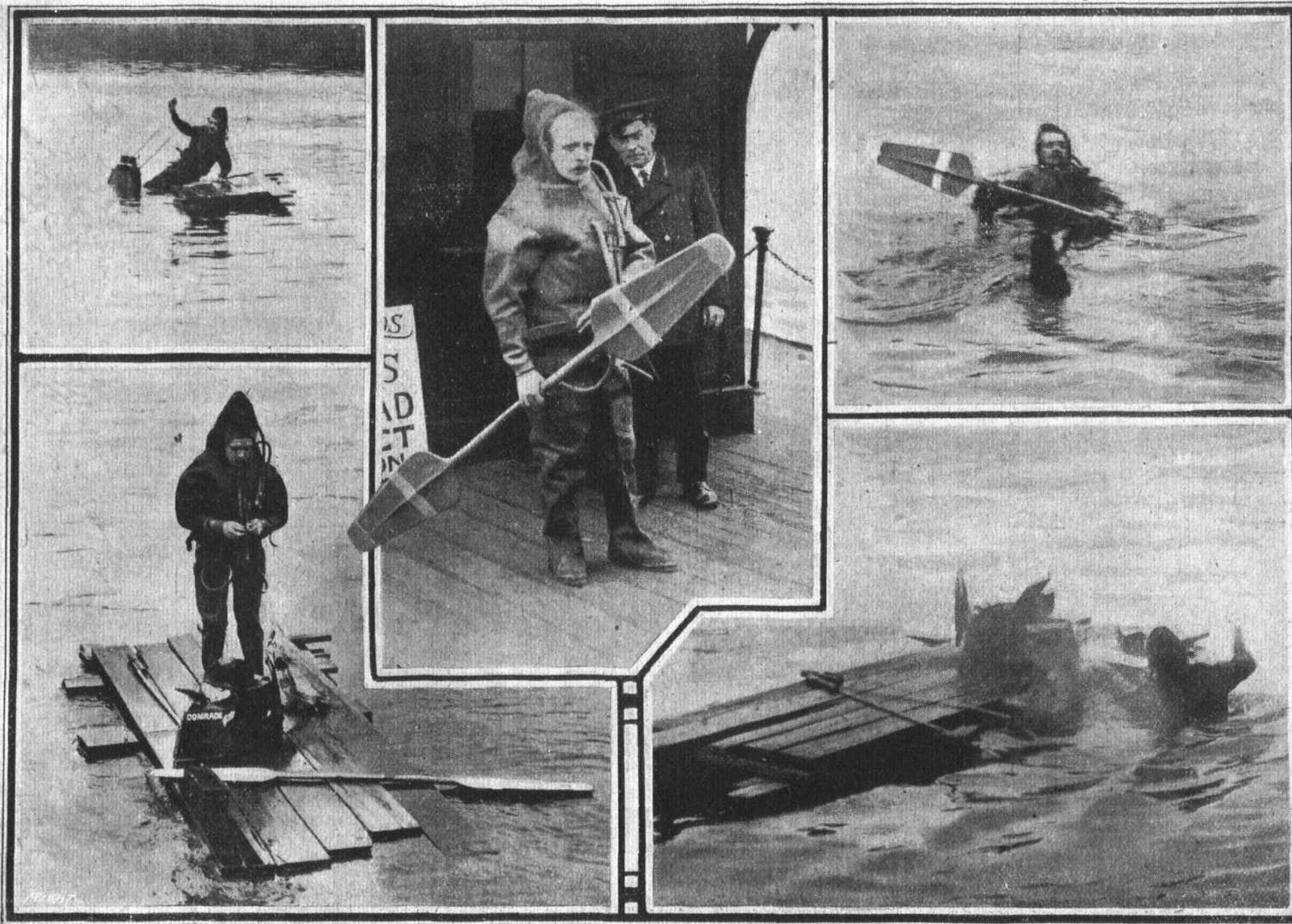
The Bombing of Bruges.

"Two nights ago I was able from a distance to watch the bombing of Bruges docks and the basins on the Zeebrugge Canal by our naval airmen," wrote the *Times* correspondent at Headquarters in France on October 16th. "While too far away to see the details, it was a magnificent sight. Wheeling, crossing, entangling as they were, it was not possible to count the searchlights, but I made out 18 in one small area, and the air was sprinkled with the pin-points of exploding shells from

anti-aircraft guns. The uproar of the bombs and the guns was as continuous as I have ever heard in any raid on London—though I have missed the recent ones there—or elsewhere.

"I can testify that long after the raid was over a great red fire burned on through the night.

"Such affairs are almost daily and nightly incidents on the battle-front, and though they pass as details of the day's work, and are not 'reprisals,' I think it would comfort the souls of Londoners to see them."



Some interesting snapshots at the demonstration of the Davidson life-saving dress.—The centre picture shows the complete dress as worn by a seaplane pilot, with the inflating tubes in position. Very little air is required to fill the air-pockets, and by the mouth the wearer can inflate it in a few seconds. Top left: The releasing of a carrier pigeon; right: Travelling in a comfortable position by means of the paddle. Bottom left: Preparing a rocket to take up a parachute light. The pilot is standing on a raft built in the water from pieces of floating timber. Right: Burning a night flare as a signal.

AIRCRAFT ENGINEERING NOTES.

Overloading Factory Buildings.

At a time when the utmost is demanded of every machine tool and every available square inch of factory space, it behoves those responsible for the planning of shops and the placing of machinery to consider well the report of the commission which investigated the catastrophe at the Renault factory near Paris some months ago. One of the buildings collapsed, with the result that about 30 workpeople were killed. The report states that 100 lathes, weighing 7 to 8 tons each, were installed on the upper floors of a steel girder and brick building. Fears were entertained as to the strength of the building, but the contractors, after carrying out an examination, made a reassuring report. It was only a little later that the collapse occurred, mainly due to inadequate foundations. A similar cause was also assigned for the collapse of another building in the same works which was wrecked in a gale.

Fireproof Dopes.

FROM New York comes particulars of tests which were recently made with a varnish which when applied to aeroplane wings, for instance, is said to render them fireproof. Unfortunately, beyond the bare statement that it makes the surface air-tight, impervious to moisture and absolutely smooth, details are lacking as to this new dope, which is the invention of Mr. Parker R. Bradley, who is connected with Weeks and Co., of New York. In the tests which were carried out, before representatives of the U.S.A. and French aviation services, a section of an aeroplane wing which had been coated with ordinary dope was splashed with petrol and a light applied. In thirty seconds the whole of the section had been consumed. Another section which had been treated with the fireproof

varnish was then drenched with petrol and a torch applied. Although the whole section was at once a mass of hot flames, the conflagration soon died down and the fabric of the wing was found to be intact, although here and there it had been discoloured and scorched. There was also said to be no buckling or warping of the framework of the wing.

It is stated that the Weeks firm have devised a scheme by which the varnish is applied by machine and then dried in an oven, so effecting a considerable saving in time.

The Application of Dopes, &c.

WHILE of late years considerable advance has been made in the development of suitable dopes for treating the wings of aeroplanes, little has been done in the way of improving the methods of their application. The old-fashioned way of laying on successive coats by means of a brush has held its own despite the fact that it is a lengthy and laborious process. Attention is, however, being given to the matter with a view to utilising the mechanical devices which are known as air brushes, or as they are termed in the States "paint guns." So far, we understand difficulty has been experienced which precludes their use for the application of dopes, but their use is being taken up for the application of paints and varnishes to parts of aeroplanes. If the difficulties can be overcome—and doubtless they will be in time—the use of such appliances for all the processes of doping should result in a considerable saving in the time which a machine has to spend in the dope-shop, besides ensuring that the coats were of an even thickness. The force with which the material is sprayed would also tend to force it into the fabric in a way which cannot be attained with the most careful brush work.



THE DAVIDSON LIFE-SAVING DRESS FOR SEAPLANE PILOTS.

AN interesting display was given on the Thames between Putney and Hammersmith on Saturday, when Mr. L. Morgan gave a demonstration of the utility of the Davidson Dress.

The costume is composed of a tunic with chest air chambers and inflating tubes with which the wearer may inflate the dress or regulate the buoyancy. The next item is a belt arranged to ensure an equal pressure round the waist, and covering two flanges ensuring a watertight joint.

The pants, or lower portion of the dress, also have air chambers which allow perfect freedom of the legs, and inflating tubes similar to those for the tunic.

The dress weighs 12½ lb., and it is said to be able to support 38 stone, thus allowing the wearer to aid others.

The air chambers are inflated from the mouth, and the wearer can be ready to take the water in 40 seconds. A double ended paddle is used for propelling. By the adjustment of the air chamber pressure, the wearer may float comfortably in a reclining position and paddle along, or may

remain upright when working at salvage or raft building. Certainly, at Saturday's demonstration, Mr. Morgan appeared perfectly at ease in the water, and able to perform his duties. Slipping overboard from the steam launch "Royalty," just below Putney Bridge, he paddled and floated and stood in the water with apparent comfort. Then some timber was put overboard, from which he was able to construct a very efficient raft. From a buoyant receptacle which he had with him in the water, he liberated several pigeons, fired rockets, and showed flares, including in his exhibition the fixing and firing of a mine in mimic for the destruction of a bridge or the like.

As a dress to be worn in the building of pontoon bridges, the fixing of charges under a bridge, or work of a similar nature, the dress should be admirable, and just now particularly in its original service for aeroplane pilots flying over the water, but in this last respect it would be interesting to know what danger of puncture there is, in the event of anything approaching a crash in "landing" on the water.



Fatal Accidents.

LIEUT. WILLIAM C. THOMPSON, R.F.C., was killed while flying at Montrose on October 16th. He was ascending and when a short distance from the ground the aeroplane fell, killing the pilot instantly.

A flying accident occurred in Lincolnshire on the evening of October 16th, resulting in the death of two officers—Capt. Reid, who recently won the Military Cross for work in France and has been at the front about a year, and 2nd Lieut. Cameron. The machine dropped from a height of 900 ft.

2nd Lieut. Gilbert, of the R.F.C., was flying over Carshalton on October 18th, when his machine fell into the grounds of Queen Mary's Hospital, and he was killed.

On October 15th at an inquest on S. G. Cowrie, who was killed while flying on October 13th, evidence was given that at a height of about 500 ft. the machine commenced to spin, the pilot failing to realise that he was at such a low altitude. The machine crashed to the ground. Mr. G. W. Beatty said the deceased was an experienced pilot instructor, but this was the first time he had attempted a spin. Witness had advised him that before doing so his machine should be at a considerable height, so as to allow for a nose-dive afterwards. He thought there was an error of judgment. The jury returned a verdict of "Accidental Death."

Another Raid on Essen.

SOME details of the recent raid on Essen have been sent by the *Daily Chronicle* correspondent in Paris. He says: "Krupp's works at Essen have been bombarded a second time by a French aeroplane. The aviator, Sergt. Luc Jardin, on returning, had to land in Switzerland, where he is now interned. In a letter to his commanding officer he relates that, leaving Nancy at 8.45, he crossed the Rhine at 10.35, and at 11.40 dropped his ten bombs upon Essen from an altitude of over 9,000 ft.

"Returning he was hampered by mist and wind, and descending to 1,500 ft. from the ground was fired upon by anti-aircraft guns. He quickly reascended, and sheered from west-south-west for 45 minutes over the mountains, believing he was in the Vosges, near Altkirch, when he decided to alight, thinking he was in France. The dense fog caused him to strike against a tree. His machine caught fire, but he landed unhurt at five in the morning, and ran towards a building where lights were burning. To his amazement he saw a signboard in German, and thought he was lost. A passing peasant told him he was in Switzerland, about three miles from the German frontier.

"It was on his own initiative that Jardin bombed Essen, for he and his companions had been ordered to Frankfurt only."

AIRISMS FROM THE FOUR WINDS

THE Margate "Gotha Souvenir" auction sale, to be inaugurated by the town's Mayor this week, should bring in a good round sum in aid of the local charities, for the benefit of which about 1,500 parcels have been gotten together, with the permission of the Admiralty.

OUR Volunteers, who are only too anxious to get going at something of practical value to the country, should be very helpful, if properly organised, in connection with the air-raids on London.

WITHOUT doubt the substitution of the bugle for giving notice of "All clear" after a raid is a substantial improvement upon repeating the police whistle warning to "take cover." Most folk who might have ventured forth after a time for observation purposes, wisely taking no chances, promptly dived back into their cover positions, upon hearing the whistle for the second time.

In the meantime the whole system of warnings is again being considered.

"The louder the guns,
The fewer the Huns."

is Miss Shirley Kellogg's view of the London defence "barrage."

PROBABLY the German advertisement expert for Hun war-loans is a sufficiently good judge of the German people to gauge their weak spots successfully. In this connection a Cologne newspaper upon the eve of the closing of the last loan, published in type across a whole page the following advertisement:—

"If next Sunday we could get sausage soup with beans, wouldn't that give us all pleasure? Alas! such pleasures are only possible in peace time. To get peace we must have money to fight until our enemies see that their efforts are bound to be fruitless."

Pending the arrival of those halcyon days of peace, the Huns are likely to get beans minus the sausage soup.

QUITE a picturesque fight has been in operation up Islington way with three candidates in the field, including Mr. Pem-

berton Billing's "Vigilante" candidate, Mr. A. Baker, who is officially described as "Independent." "P.B." in this case defines "Independent" as embodying an effort to

"Purify Politics."

"Pulverise Potsdam."

"Petrify Huns."

THE result of the Poll was not very unexpected, but if that's what the return to the House of Commons of "Vigilantes" really means, let the thing go on.

ST. JOHN'S Ambulance Brigade needed a motor ambulance for use by its Limehouse Section for service during air raids. A house to house collection in Limehouse and Stepney has resulted in £200 being raised towards the £400 needed.

IN order to familiarise the public with the achievements of the British Navy and Air Service, Major Corbett-Smith, R.A., with the cordial assent of the Department of Information, is undertaking lecturing tours during the winter. The title of the lectures will be "With Our Navy," and they are being given in the public interest. All fees will be devoted to naval war charities. Communications should be addressed to Mr. G. Christy, Outer Temple, W.C.2.

THE way to "scotch" Prussianism. *Apropos* the "To raid or not to raid" controversy raging in some of the dailies, between bishops, their satellites and the public, Mr. Norman Clough, from North Wales, asks "What are reprisals?" and supplies the very suggestive answer in the same line as follows:

"In July last a correspondent wrote thus to the Archbishop of Canterbury:

We want to see the (German) streets run red with blood, and the women and children reduced to pulp.

"Now, the Rev. Mr. Chasubel, whose diocesan will not allow him to use ceremonial incense, and the Rev. Erastus Brown, who has just seen the desirable living of Otium-cum-Digge given to a less worthy man than he, may take joy in having an anonymous smack at their bishop, but they are not more desirous to bedabble Romish vestments or Geneva gowns with the blood of German babies than is the wearer



Diverting a River.—The Lord Mayor, Sir W. H. Dunn, performing the ceremony of diverting the Cardinal Wolsey River at the Whitehead Aerodrome last week. The speaker by the side of the Lord Mayor is Mr. Whitehead.

of lawn sleeves his episcopal robes. And the Government may pretend to adopt a policy of reprisals in deference to an all-powerful Press, but they do not set out with the intent to reduce German women and children to pulp either. It really is not done—by Englishmen.

"Be tranquil, good Father Chasubel! Sleep softly, oh Reverend Erastus! When the Belgian coast is ours there will be plenty of air raids on Germany. You will hail them as reprisals, but they will be definite military operations taken with no backward thought of the past, but with a resolute looking forward to the downfall of Prussianism and the attainment of that peace with victory for which your bishops are as earnest as all other true Britons."

It may be as well to make note of the fact that the Allgemeine Electricitäts Gesellschaft (the great "A.E.G." General Electrical Company), Germany's largest industrial (now fully engaged on munitions) undertaking next to Krupp's, has just raised its capital by £1,450,000 to £10,000,000. It announces that on July 1st, 1917, it employed 79,293 hands—"in Germany." Most of the energies of this concern are devoted to the manufacture of parts for submarines and aeroplane engines.

SPRING, beautiful Spring!

OPPORTUNITY has offered, in the presence of Lord Northcliffe in America, to present to Mr. Orville Wright the Royal Albert Medal, which has been awarded to him. Lord Northcliffe's visit to Dayton, Ohio, during his tour of inspection of munitions and other factories in the Middle West was the occasion selected for the formal presentation.

A HEALTHY sign of the times from the *London Gazette* of October 21st:—Two "Leading Aircraftsmen" have been entered as Probationary Observer Officers."

THERE must be very few quarters now in official Germany where it is not pretty fully realised that, outside a miracle, the Central Powers are for all practical purposes already beaten. This spells bankruptcy pure and simple for the country, hence no doubt the very energetic propaganda which is now being carried out in the German army by means of great posters and leaflets setting forth the dismal alternative to a Hindenburg peace. It is categorically demonstrated therein that unless Germany conquers she is hopelessly bankrupt.

PROBABLY this is but a carefully thought out plan to prepare the duped Hun mind for the complete repudiation, after peace, of all internal loans. But it will hardly stave off the reckoning by the people with those who have brought about the break-up of a hundred years' industrial accumulations, "Germany the next Republic," truly.

THIS is how the *Münchener Post* pleads, "Please, don't hit back": "Air attacks on open towns have proved to

be the means of stiffening rather than weakening the determination of people, and this applies to all belligerents. It would be a matter of rejoicing if all the belligerents agree no longer to make this fearful world catastrophe still more horrible through the slaughter of defenceless persons." It is quaint how, in addition, quite a lot of other German newspapers are now seriously debating as to the wisdom and desirability of bombarding open towns from the air.

A COMPLETE naval convoy's outfit should include a seaplane for scouting purposes.

A YOUNG gentleman whose name is well known throughout the aircraft industry, tells a good story against himself. He had accepted an invitation to the recent ceremony at the Whitehead Aerodrome at Hanworth Park, and started to motor there accompanied by his wife. He was not sure of the road, never having been there before, but as they drew near to Feltham he saw a number of cars and taxis, all going in the same direction, and concluded he could not do better than follow them. He did so for some time, but the pace being extremely slow, he decided to push on ahead. . . . In front of the procession was a hearse!

THE details of the new Government Aircraft Insurance Scheme are in course of settlement.

MOST interesting is it to play the eavesdropper when folk in public places come to arguments on matters aviatric. Also, so near are many of them to the truth, albeit that they mix many truths to form an untruth, that it would be hard to convince them of their error and put them right. Thus, two items overheard in the same place, and within a few minutes:—

"There is one of our machines up there now, somewhere. The pilot dropped a spanner with a note tied to it saying his machine had got its tail down and couldn't get her nose down to land. I know a man who was there when the spanner dropped."

This did not satisfy the second man who evidently knew something about aviation, but he was completely routed by this:—

"I know it's perfectly true. Look here, you know all about aviation. How can a man get down unless he can get the nose of the machine to point down? Did you ever see an aeroplane land except head downwards? I tell you if he can't get her nose down he can't land. Besides I know the man who picked up the spanner with the message tied to it."

IN the second instance they were arguing about observation balloons. One said they were gas balloons and the other that they were air balloons.

"I tell you they are gas balloons. I've seen those Long Tom cylinder things that they fill them from. Besides they must have gas, how could they keep up and lift two men without?"

"They're not," says the other, "they're air balloons."



ON THE ICE.—German seaplanes outside their station. Note the twin-engine seaplane on the left.

I've been near when they have pulled them down. You know those big lumps at the end? Well, that's where the wind goes in. They're open, and the wind goes in there and fills the bag. I've seen them collapse when they are pulled down. Those kite things keep them head to the wind on purpose, so the wind can rush in and fill the bag."

A third man in the party, evidently the wag, said he had always thought they were canteens for the airmen.

THE same wag suggested that the reason the Zeppelins went astray the other night was by reason of a surprise we had prepared for the German raiders. We had, he said, been for a long time training vast coveys of sparrows, and when the Zepps. came over we sent them up to pick the currents out of the magnetos. He is still alive!

MAJOR H. L. NIXON writing from the Administrative Staff Headquarters, School of Technical Training, R.F.C., is desirous of obtaining the loan of a pack of 12 couple of beagles or Bassett hounds for the coming winter. The object is to provide sport for officers and men of the R.F.C. on the station during the week-ends, and "I can give every assurance," says Major Nixon, "that the hounds will be kept in perfect condition."

Can any of our readers help?

"ONE Service, one Uniform, one Badge." From the *Daily Sketch*—

"Imperial Air Service.—I am assured that the two flying services are to be grouped under the one name—"The Imperial Air Service." There will also, I hear, be one regulation dress for all, consisting of navy-blue tunic, scarlet riding breeches, and leggings. Those scarlet breeches sound a bit fantastic, but fortunately they will be hidden from the Hun."

We hope it'll not be quite as bad as that!

PRESUMABLY the following from the *Daily News* is supposed to be funny:—

"Nobody Loves It.—There seems to be a singular lack of enthusiasm in the service itself about the forthcoming Royal Air Service. 'I wish I knew some influential M.P.s,' an aviator writes to me.

"There are three questions I should like to see answered:

- (1) Do the Navy want it?
- (2) Do the Army want it?
- (3) Who does want it?

I might answer the third, but I do not quite know why they profess to want it, except that the question affords a fair peg for a newspaper campaign.

"Then there is the uniform. Khaki, a correspondent

urges, is well enough for the earth, but visible in the sky. He suggests grey-green. Really the airman ought to have a number of uniforms to tone in with the changing skies, like a fashionable lady's dresses. But tradition is still strong in the services, and perhaps the new mixed force will be called upon to recall permanently their mixed military and naval origin by wearing blue trousers and red tunics, or *vice versa*."

WE wonder who "An Aviator Writes Me" is?

"PAY of aircraft woodworkers.—A strong appeal has been made to ten executive councils of building trades unions to permit a system of payment by result being established for the period of the war amongst aircraft woodworkers, guarantee to be given that any such system would be abolished immediately peace is declared."—*Daily Paper*.

Mark you, a permit to pay a man what he really earns! What a commentary upon trade unionism as she is at present run.

IT has often been claimed that an ammonia engine is the engine of the future for motor cars and what not. A rather crude attempt to demonstrate its adaptability for aerial power purposes has, apparently, been tried out in the provinces, resulting in the following report:—

"Street Sweeper's Flight.—An ammonia compressor engine exploded early this morning at Liverpool. A street sweeper was carried off his feet and dropped 50 yards away."

Its use is hardly likely to become popular in this form.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of Oct., 1907. "FLIGHT" was founded in 1908.

NEW ZEPPELIN AIRSHIP.

Count Zeppelin is about to build another airship ("Zeppelin No. 4") of even larger dimensions than his present model, to be equipped with motive power of about 300 h.p. The construction of this new machine is to be undertaken, it is stated, at the suggestion of the German Government, which has now taken over the present airship shed on Lake Constance, towards the construction of which they advanced Count Zeppelin a sum of £25,000. The new airship will be designed to carry a crew of 18 men.

THE BAYARD-CLEMENT AIRSHIP.

M. Clement, the well-known motor car manufacturer, contemplates the construction of an airship. At the present time nothing is ready but the drawings, which are arranged round the walls of a large hall belonging to the Levallois works, in which the airship is to be erected by M. Capazza.

GERMANY'S AIR OFFENSIVE.

A COMMUNICATON from the War Correspondents' Headquarters with the French Army states that the following information regarding the progress of the aviation industry in Germany recently came to the knowledge of the French General Staff.

Well aware that some time next year the new American air squadrons will come into action on the Western front, the Germans are already straining every nerve in order to be able to meet the Allied air offensive next spring. The number of German battleplanes is to be doubled during the coming winter, and the aeroplane and motor-building factories throughout Germany are enlarging their plant and obtaining reinforcements of labour to enable them to cope with the sudden influx of orders.

Switzerland is being laid under contribution. Two hundred and fifty Argus motors have been ordered from a firm in the Zurich district. The Fokker firm, which is building fighting biplanes in great numbers, as well as a triplane remarkable for its speed and climbing powers, has taken over the great Berzina piano factories in Schwerin.

For bombing formations heavy three-seater machines are being built which can carry between seventeen and eighteen hundred pounds weight of bombs. They have Mercedes 260 h.p. motors, and when loaded can climb 12,000 ft. in 35 minutes. In every type of flying machine the Germans are feverishly producing new models, for long-distance scouting expeditions. The 1917 Rumpler, with 260 h.p. Mercedes motor, is said to be the best machine. They are also building a machine, made entirely of metal, to operate in conjunction with infantry on the battlefield. It has no great speed, and is a notably slow climber, and does not seem to be able to rise much above 10,000 ft. The enemy is also using a new six-cylinder Maybach motor, developing 240 h.p., which is lighter than the ordinary Mercedes and gives greater speed in climbing. A big German bombing machine which

lately landed in Holland was fitted with an electrical installation, driven by motor, for the purpose of warming the airman.

During the six months from February to August, 29 important industrial establishments were added to the number of factories making aeroplanes or their accessories in Germany.

Simultaneously with this great increase in the output of machines, the Germans are looking everywhere for recruits for the flying service. Applications for transfer to the air service are now received from both infantry and engineers, instead of being restricted to cavalry as was the case not long ago. Applications are now dealt with in a month instead of two months, and there is no doubt that, in the course of the present year, the personnel of the German air service has been largely reinforced. Volunteers are wanted chiefly for the fighting planes, because it is chiefly among the fighting squadrons engaged on the battlefields that casualties occur, but a large number of officers are being trained as observers for observation planes.

It is interesting to note that while the enemy is making all these efforts in order to be able at least to hold his own in the air next spring, German commanders are being recommended to use their airmen and machines, for the moment, as economically as possible. An order signed by General von Ludendorff, dated June, which has fallen into our hands, says that the Allies are employing their aeroplanes economically with a view to the great battles of the future.

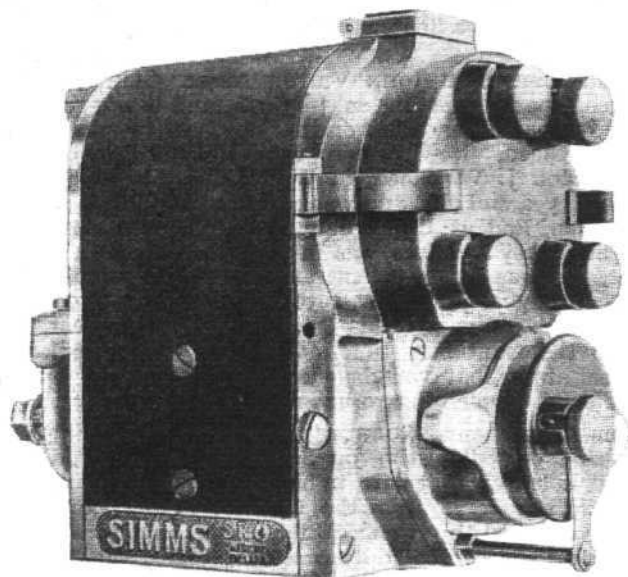
"We should be wrong (it adds) to overwork and wear out our air formations, which are inferior in numbers, by sending them out several times every day. Consequently, the infantry and artillery must be told that it is impossible to prevent the enemy's planes from flying over our lines, and they must not get nervous when they see them overhead. Airmen are to be used sparingly in calm times in order that Germany may have as many of them as possible for great emergencies."

MAGNETO IGNITION.

V.—THE SIMMS MAGNETO.

REPOSING on a blue velvet pedestal in the waiting-room at the offices of Simms Motor Units, Ltd., in Percy Buildings, Gresse Street, W., is a substantial-looking magneto machine. Underneath is this inscription: "The Father of all the Magnetos, the first Low Tension magneto, with oscillating sleeve, ever constructed for high speed internal combustion engines." What a difference there is between that old Simms-Bosch magneto, with what would be called crude construction to-day, and the latest Simms S.R. magnetos with their beautiful workmanship and dapper finish.

From the section of the Simms S.R.4 magneto it will be apparent that in its general lines it follows approved practice



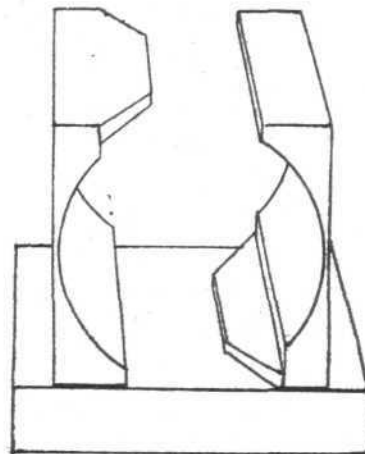
General view of the Simms H.T. magneto.

as regards the design and arrangement of the various parts, while actual inspection of a magneto emphasises not only the excellent workmanship—which one would expect—but also that wherever possible advantage has been taken of the best and most up-to-date manufacturing methods, as, for instance, in the use of die castings. The armature carries both the primary and secondary windings, and at one end is the condenser. The high tension current is picked up from a slip

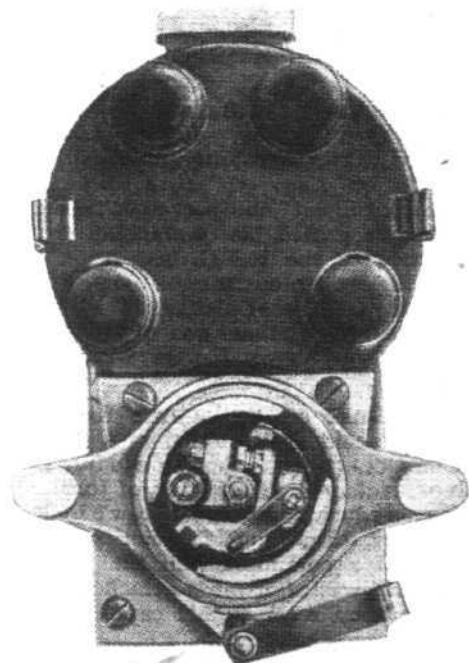
the magneto to produce a spark of unusual intensity at full retard at low speed. The way in which the pole shoe is made is clearly shown in the sketch, and it will be seen that at those edges where the magnetic flux is "cut" there is an extension on the pole shoe. It is as though the pole piece were extended further round, than the position opposite the other edge of the same pole piece, and that then a right-angled groove were cut in the extension. This gives two edges which the armature has to pass, and they are so designed that the gap between the first edge, or what may be termed the main edge of the pole piece, is slightly smaller than that between the armature and the edge of the extension.

The result is that when the armature is running slowly the magnetic lines crowd into the central portion and hang on as long as possible before being cut. When the armature is running faster, however, the magnetic lines choosing the shortest path are cut at the first point, which provides a smaller air gap than does the edge of the extended pole piece. This greatly facilitates starting as well as giving a full spark when the engine is running slow.

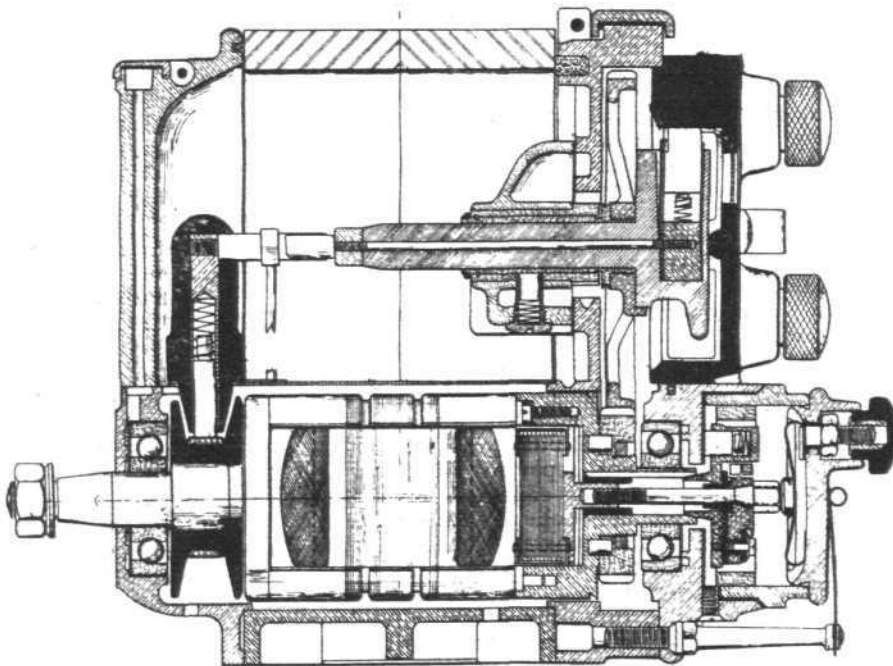
Throughout the whole design and construction of the Simms magnetos care has been taken to see that every working part is substantial and fully able to play its part efficiently, but at the same time no effort has been spared to keep weight down as far as possible. Convenience has also received a great deal of consideration, so that there can be no excuse for the neglect of such essential little attentions as lubrication, the dusting out of carbon dust in the distributor, &c. Whenever it is necessary, for these or other purposes, for parts to be opened up it will be found that the joints have been made so as to effectively exclude dust and dirt, while the fastenings are of simple but strong construction.



The pole pieces on the Simms S.R. magneto, showing the extension which enables good sparking to be obtained with the ignition retarded.



End view of the Simms magneto, showing contact breaker.



Longitudinal section of the Simms S.R. magneto.

ring by a carbon brush and is led in the usual way to the distributor. To provide against excessive voltage a safety spark gap is fitted. The general arrangement of the Low Tension contact breaker is shown in the end view of the machine.

One of the characteristic features of the Simms magneto is the arrangement of extended pole pieces or shoes which enable

Two models of the Simms S.R. magneto are made, one—known as the S.R. 4—for four-cylinder engines, and the other—the S.R. 6—for six-cylinder machines. Both give two sparks per revolution of the armature, the S.R. 4, therefore, being driven at the same speed as the crankshaft, while the S.R. 6 is driven at $1\frac{1}{2}$ times engine speed.

PERSONALS

Casualties.

Second-Lieutenant JOHN PERCY FITZHERBERT ADAMS, Durham Light Infantry, attached R.F.C., was killed on October 14th while carrying out his duties as an observer. A sudden attack was made upon his machine in the air by a hostile machine, and an engagement ensued at close quarters, but after firing five rounds the pilot observed that no more were fired by Second-Lieutenant Adams, and he at once came down successfully on our side; the machine was much damaged and the observer dead and still holding his gun. Second-Lieutenant Adams was the second son of Colonel Herbert Adams, V.D., and Mrs. Adams, and was educated principally at St. Bees School, St. Augustine's College, Canterbury, and Durham University. He had a great reputation as a Rugby football player. He was ordained deacon at Advent, 1914, and proceeded very shortly to St. John's, Newfoundland, as a curate. There he remained until the following September, when he obtained the sanction of his bishop to come home to take up arms, and very soon obtained his commission in the Durham Light Infantry. In June, 1916, he left England for the front, and was soon wounded by shrapnel. After about three months he was passed for duty again, and subsequently returned to the front, and saw more fighting, and afterwards volunteered for the R.F.C., joining a squadron after a few weeks' training in England. He was highly esteemed as a capable and gallant officer.

Flight Sub-Lieutenant MAURICE NELSON BARON, R.N., previously missing, now reported killed in action on August 15th, aged 18, was the eldest son of Canon and Mrs. Baron, Alford Vicarage, Lincs.

Flight Sub-Lieutenant NORMAN BLACK, who is officially reported missing, will be well remembered as Senior Grecian and Captain of the School at Christ's Hospital, which he left in July, 1916, to enter the air service. He was in his 20th year.

Second-Lieutenant A. J. CHAPMAN, R.F.C., was the elder son of Mr. J. B. Chapman, Town Clerk of Burton-upon-Trent, and Mrs. Chapman. Educated at Hymers College, Hull, he was articled as a solicitor to Messrs. Drewry and Newbold, of Burton-upon-Trent, in 1913, and passed his intermediate law examination in the summer of 1914. On the outbreak of war he enlisted in the Public Schools Battalion of the Royal Fusiliers, and was in France from November, 1915, to April, 1916. He then came back to England, having been recommended for a commission, and received instruction as an infantry officer. He was, however, gazetted to the R.F.C., and after instruction was engaged on testing new machines. He left for the front on June 13th, and was engaged on patrol work, and on several occasions took part in attacking the German infantry. He came home on leave on September 1st, arriving back at the front on the 17th. On the following morning he went out on patrol, and did not return. His commanding officer writes that "a message was received from a German aeroplane stating that Second-Lieutenant A. J. Chapman was killed in an air fight near Cambrai on September 18th."

Captain GUY LINDSAY CRUIKSHANK, D.S.O., M.C., Gordon Highlanders and R.F.C., reported missing on September 15th, 1916, now reported killed on that day, was 26 years of age. He was educated at King's School, Rochester, and Emmanuel College, Cambridge. At the outbreak of the war he was quartered at the Central Flying School, Upavon, was one of the first to cross the Channel with his squadron, and was in the fighting line continuously until his death. He received the Military Cross in June, 1915, and in September of the same year was awarded the D.S.O. for "conspicuous gallantry in successfully carrying out a special mission involving great risk." He was mentioned twice in despatches. An article in *Blackwood's Magazine* of March states that he was one of the greatest pilots produced by the war.

Lieutenant BASIL R. DAVIS, Royal Fusiliers and R.F.C., killed in action on September 20th, aged 22, was the second son of Mr. and Mrs. A. E. Davis, 18 Wetherby Mansions, S.W.

Second-Lieutenant DE LACEY, West Yorkshire Regiment, attached R.F.C., killed in action on September 23rd, aged 21,

was the only son of Dr. and Mrs. De Lacey, 4, Jesmond Road, Newcastle-on-Tyne.

Lieutenant EDGAR DANIEL GIBSON, R.F.C., who has been killed at the front in France was the second son of Mr. Walter Gibson, M.V.O., of Oxted, Surrey, Secretary of the Privy Purse to His Majesty the King. Mr. Gibson lost his eldest son, a lieutenant in the East Surrey Regiment, in 1915.

Second-Lieutenant JOHN VICTOR ARIEL GLEED, R.F.C., who was reported missing on July 7th, and is now officially reported to have been killed on that day, was the elder son of Mr. J. W. Gleed, Vice-Chairman of the Holland County Council, and Mrs. J. W. Gleed, of West Elloe, Spalding, Lincs. He was 20 years of age, and was educated at Lydgate House, Hunstanton, and at Uppingham, where he represented the school at hockey and fives, was in the school second eleven at cricket, and was most efficient at all outdoor pursuits. On leaving Uppingham at Easter, 1916, he received his commission in the R.F.C., obtained his "wings" in September, and went to the front last June. On July 7th he took part in a great air combat over the enemy's lines, and now appears in an official German list to have died on that day.

Second-Lieutenant ROBERT ANDERSON INGLIS, R.F.C., who was reported missing on September 21st last, is now reported killed on that date in his 19th year. The news of his death has come from the German Flying Corps in a message dropped by them. Lieutenant Inglis, who was the younger son of Mr. Andrew Glover Inglis, City Coroner of Liverpool, and Mrs. Inglis, of 16, Sefton Drive, Liverpool, was educated at Greenbank School, Sefton Park, and subsequently at Gresham School, Holt, Norfolk. On leaving school he became an apprentice in the office of Messrs. Balfour, Williamson and Co, and in December last joined the Inns of Court O.T.C. He subsequently volunteered for flying, and after passing through his course of training went to the front at the beginning of September.

Second-Lieutenant D. C. H. MACBRAYNE, R.F.C., who was previously reported missing on June 21st, is now reported killed, aged 19. He was educated at Eton College, which he left in August 1916, to take a commission in the R.F.C. He was the son of Mr. D. H. MacBrayne, of 19, Woodlands Terrace, Glasgow, chairman of David MacBrayne (Limited), and a grandson of the late David MacBrayne, shipowner, Glasgow.

Lieutenant NORWOOD MACLEOD, C.F.A., attached R.F.C., was killed on Oct. 14th when landing. He was educated in Canada and the United States, finishing at Cornell. He joined the Canadian F.A. on Aug. 5th, 1914, came over with the first Canadian contingent, and served in Flanders until August, 1916, when he gained his commission on the field. He became attached to the R.F.C. last April, and returned to the fighting line two months ago. His captain refers to him as a pilot of exceptional ability, on whom he could always rely. He was the younger son of Mr. Henry C. MacLeod, of Toronto, a well-known banker, who is temporarily in London.

Captain IVAN MACKAY, Duke of Wellington's Regiment, attached R.F.C., who was accidentally killed in a collision in the air at the front on Oct. 5th, was the son of Mr. James H. Mackay, of the firm of Mackay Brothers, Ltd., of Johannesburg and Durban. He was educated at St. Andrew's College, Grahamstown, Cape Colony, came to this country at the end of 1916, and obtained a commission in the Duke of Wellington's Regiment. He was afterwards attached to the Royal Flying Corps. He soon received his captaincy and left for the front about three weeks ago.

Captain JACK MANLEY, R.F.C., son of Mr. and Mrs. Manley, of Caldicote, Heyford, Oxon., was born in 1897, and educated at Taunton School. He then entered the Great Western Railway works at Swindon, to learn engineering, but feeling it "his plain and simple duty" to join the Army, he obtained his pilot's certificate, and was gazetted in March, 1916. He was severely wounded in a fight on July 20th, 1916, and with one arm useless brought his machine and observer back, and landed safely. After a few weeks in hospital he was brought to the R.F.C. Hospital in Bryanston Square, where,

after much suffering, he recovered. He then took up work as an instructor, but later returned to the front, where he did much good work on a scout machine. He was killed on Sept. 18th.

Lieutenant PHILIP MIGHELL, East Surrey Regiment, att'd. R.F.C., late Signalling Officer of an Infantry Brigade, who died on Oct. 12th of wounds received in action, aged 24, was the eldest son of Mr. and Mrs. Philip Mighell, Manor Farm, Beddington, Surrey.

Second-Lieutenant JOHN ELLIOTT TERRY, R.F.C., who died in hospital abroad on October 16th, was the elder son of Mr. and Mrs. John H. Terry, of Elstree, Herts., and dearly loved husband of Phyllis Terry (*née* Stockings).

Second-Lieutenant A. J. D. TORRY, M.C., R.G.A., att'd. R.F.C., who was killed in an air fight on Oct. 9th, was the only son of the late Rev. A. F. Torry, rector of Marston, Beds., formerly Dean of St. John's College, Cambridge, and brother of Miss E. Torry, 38, Belsize Park Gardens, N.W. He was educated at Bedford Grammar School and St. John's College, Cambridge. At the outbreak of war he joined the Public Schools Brigade, and received a commission in the R.G.A. in April, 1915. He went to the front in September, 1915, and was continually on active service until his death. He was awarded the Military Cross on the field for conspicuous bravery in October, 1916.

Lieutenant JOHN RAWSTHORNE TYRER, Manchester Regiment, att'd. R.F.C., killed in action on Oct. 9th, aged 22, was the eldest son of Mr. and Mrs. T. G. Tyrer, Henderson Road, Wandsworth Common, S.W.

Second-Lieutenant ERIC DELANOY TYZACK, R.E., att'd. R.F.C., killed in action on Sept. 5th, aged 26, was the only son of Frederick Tyzack, Psalter House, Sheffield.

Lieutenant ERIC RUSSELL WILKINSON, M.C., Middlesex Regiment, and R.F.C., who died of wounds on Oct. 7th, aged 23, was the youngest son of the late C. H. Wilkinson, and Mrs. Wilkinson, of 55, St. Mary's Mansion, W. 2.

Captain GUY P. REID, M.C., Seaforth Highlanders and R.F.C., who was killed in a flying accident on October 16th, aged 20, was the youngest son of Mr and Mrs. T. M. Reid, of Puerto Orotava, Tenerife.

Lieutenant ALISTER DOUGLAS STEWART, R.F.C., who was accidentally killed while flying in Wiltshire on Oct. 13th, was the youngest son of the late Capt. M. P. Stewart, of Plas Godwing, Bangor, North Wales, and Mrs. Stewart, of Coolmac, Parkstone, Dorset. He was educated at Colet House, Rhyl, North Wales, and afterwards at Cheltenham College ("Southwood House") and trained for land agency at Cirencester Agricultural College, and also became a Professional Associate of the Surveyors' Institute and Land Agents' Society, afterwards being agent for Little Green and Stanted Estates, Petersfield, Hampshire. In 1914 he was offered a post in the War Land Department, which he held until early in the present year. Feeling flying was more

important, he, at his own request, was transferred to the R.F.C., in which he won great praise from his superior officers, and gave every promise of becoming a brilliant airman. He married in 1914 Miss Dorothy Stella Adams, younger daughter of Mr. and Mrs. Sydney Adams, "The Heath," Petersfield. The funeral, which took place on October 18th, at Upavon, was a military one, and was attended by his eldest and only surviving brother, Capt. M. D. Stewart, who had come on special leave from the General Headquarters Staff in France. His second brother, Capt. Harman Stewart, "the Royal Scots," was killed at Hooge, September, 1915.

Married.

On October 20th, at St. Philip's, Earl's Court, Lieutenant J. VINCENT BARRY, R.F.C., second son of the late James Barry, of Calcutta, was married to LOIS VERA, daughter of the late HAROLD JONES, M.Inst.C.E., and Mrs. Jones, of 8, Longridge Road, S.W.

Major W. A. BISHOP, V.C., D.S.O., M.C., of the Royal Flying Corps, was married on October 17th at Toronto, Canada, to Miss MARGARET EATON BURDEN, daughter of Mr. C. E. BURDEN, and niece of Sir John Eaton.

On October 17th, at St. Giles' Cathedral, Edinburgh, Lieutenant S. G. ROME, M.C., Argyll and Sutherland Highlanders and R.F.C., younger son of Colonel George Rome, Knockbay, Campbeltown, Argyllshire, was married to DOROTHY JALLAND, only daughter of Lieut.-Colonel HAROLD J. STILES, F.R.C.S. Ed., R.A.M.C. (Temp.), 9, Great Stuart Street, Edinburgh.

To be Married.

The engagement is announced between Flight-Lieutenant M. J. GOLDING, R.N.A.S., youngest son of Mr. and Mrs. Golding, Kneller, Feltham, Middlesex, and JEANNEE PEACOCK, third daughter of Mr. and Mrs. Peacock, Pellisson House, Redcar.

An engagement is announced between Lieutenant REGINALD S. HAWARD, Middlesex Regiment and R.F.C., youngest son of Mr. Percy G. Haward and Mrs. Haward, of 17, Ashbourne Avenue, Finchley Road, N.W., and MARGARET EDITH BALFOUR DUNCAN, daughter of Mr. James Duncan and Mrs. Duncan, of Balfour, Brechin, N.B.

Items.

Major J. L. BAIRD, D.S.O., M.P. for the Rugby Division, Parliamentary Secretary to the Air Board, has been made a magistrate for the county of Warwickshire.

The will of Captain WILFRED PALMER HORSLEY, M.C., R.F.C., East Yorks Regiment, who was killed in action on July 2nd, youngest son of Joseph Henry Horsley, of Keyston Manor, Huntingdon, and Cottingham, Yorks, has been sworn at £13,773.

Mr. G. A. Wingfield, of Hove, has received a telegram saying that his son, Lieutenant L. A. WINGFIELD, R.F.C., has escaped from Germany, and may be expected home shortly. Lieutenant Wingfield was shot down and taken prisoner on July 1st last year at the beginning of the Somme battle.



A British pilot and observer in front of their machine after it had been forced to land in the enemy's lines.



The British Air Service

"PER ARDUA AD ASTRA"



UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

Admiralty, October 17th.

Acting A.M. (1).—C. L. Bray and A. W. Wood, both entered as Prob. Observer Officer (Temp.), seniority Oct. 13th.
Chief Petty Officer.—A. Hanna, entered as Prob. Observer Officer, seniority Oct. 13th.
R. G. Mitchell entered as Prob. Observer Officer (Temp.), seniority July 22nd.
Late Probationary Flight-Officer (Temp.).—W. H. Evans, granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Oct. 5th.
Probationary Flight Officer (Temp.).—A. P. Beal, entered as Sub-Lieut., R.N.V.R. (Temp.), seniority Oct. 5th.
H. Glaisyer granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Sept. 22nd.

Admiralty, October 18th.

The following Prob. Flight Officers (Temp.) have been promoted to Flight Sub-Lieuts. (Temp.) with original seniority:—S. S. Richardson, W. J. Attwood, S. D. Culley, F. G. Newall, R. G. Bunday, L. B. Gibson, J. C. P. Simpson, A. C. Sharwood, G. S. Smith, V. J. Budd, J. E. E. Fenton, G. H. Phillips, J. K. A. Jeakes, E. F. McIlraith, J. T. Cameron, A. A. Cameron, B. B. Palmer, E. G. Johnstone, W. A. Moyle, J. L. Moran, F. H. G. Shepard, N. E. Williams, D. B. G. Francis, C. N. H. Pilney, G. A. A. Pennington, J. L. Mayer, G. C. Mackay, S. H. Atherley, E. J. L. Hope, A. E. Dyer, H. N. B. Richards, W. F. Davenport, G. S. Lewtas, J. D. Vance, A. P. Bell, A. S. Gilling, W. E. G. Mann, R. Bolton, H. E. Hyde, R. W. W. Hardie, L. E. Swann, W. F. Salton, J. Tomkins, C. A. Wilkins, and H. A. Urquhart.
G. Smart and B. E. C. Davis, both entered as Sub-Lieuts., Temp. (R.N.V.R.), seniority, respectively Oct. 13th and 15th.

Admiralty, October 19th.

Flight Commander.—C. W. H. Pulford, promoted to Act. Sqd. Comdr. seniority Oct. 17th.
Acting Squadron Commander.—R. B. Ward, confirmed in rank with original seniority of July 26th.
Prob. Flight Sub-Lieut. (Temp.).—D. R. C. Wright, confirmed in rank with original seniority of Oct. 21st, 1916.
The following Prob. Flight Officers have been promoted to Flight Sub-Lieuts. (Temp.), with original seniority:—O. W. Pellatt, W. F. Robinson, N. T. Thornloe, F. E. Dixon, W. A. Campbell, S. F. Everson, G. G. Graves, P. M. Dennett, C. P. Porter, J. T. Thornhill, G. H. Allely, W. R. Glenn, D. R. Kerr, G. R. Hake, J. K. Hardy, M. W. Maseden, G. H. Leonard, B. H. Reynolds, L. R. Warren, H. J. Elliott, and A. Nightingale.
The following Prob. Flight Officers (Temp.) have been promoted to Flight Sub-Lieuts. (Temp.), with original seniority:—B. Stevenson, C. K. Osborn, A. W. Ellis, A. G. Warner, F. P. Turner, E. W. Geere, A. R. Carbis, G. M. Emerson, D. J. Dorey, J. Maxwell, L. J. F. Muncey, J. O. Hawley, H. E. Symons, G. O. Lightbourn, T. E. Chrimes, and W. S. Grace.
Chief P.O.—H. Leedham, granted temp. commission as Lieut. (R.N.V.R.), seniority Oct. 18th.

Admiralty October 20th.

Leading Aircraftsmen.—A. D. Macmillan and N. J. Picken, both entered as Prob. Observer Officers (Temp.), seniority Oct. 22nd.
3rd Writer (R.N.).—J. Hirst, entered as Prob. Observer Officer (Temp.), seniority Oct. 27th.
The following have been entered as Prob. Flight Officers (Temp.), seniority as stated:—L. H. Thomas, Oct. 1st; S. Graham, Oct. 4th; H. C. Langstone, Oct. 7th; E. F. Kerruish, Oct. 10th; H. A. Love, D. O. B. T. McAteer, J. Malcolm, S. L. Martin, R. R. May, D. L. Melvin, T. W. Nash, L. H. Nesbitt, C. G. Nodin, J. A. H. Pegram, C. M. Waite, H. I. M. Monk, H. C. E. Adlard, I. H. Blake, C. W. Bragg, N. C. Collett, O. H. Dampier-Bennett, J. T. Dupny, J. D. Fysh, N. V. Grimsditch, E. W. Harland, R. C. Harley, R. E. Kestell, D. C. Kimmond, N. D. Lansdown, F. C. Leonard, all Oct. 14th; A. B. Hopp, Oct. 16th; J. L. Carvel, C. R. Hobbs, A. P. Morley, A. E. Saville, and W. H. Thomas, Oct. 22nd.
C. Taylor entered as Prob. Observer Officer (Temp.), seniority Oct. 27th.
B. G. McCormick granted temp. commission as Lieut. (R.N.V.R.), seniority Oct. 19th.
B. S. Sillem entered as Sub-Lieut. (Temp.), seniority Oct. 19th.

Royal Flying Corps (Military Wing).

London Gazette Supplement, October 16th.

The following appointments are made:—
Staff Officer, R.F.C., 1st Class.—Graded as an A.A.G.—Capt. C. Fraser, N. Staff R., from a Staff Offr., R.F.C., 2nd Cl. (graded as a Brig.-Maj.), and to be Temp. Lieut.-Col. while so employed, vice Maj. (Temp. Lieut.-Col.) P. R. C. Groves, Shrops. L.I.; Sept. 15th.
Staff Officer, R.F.C., 2nd Class.—Graded as a Brig.-Maj.—Capt. G. C. Anne, Yorks. L.I. (T.F.), from a Staff Offr., R.F.C. 3rd Cl. (graded as a Staff Capt.), vice Capt. (Temp. Lieut.-Col.) C. Fraser, N. Staff R.; Sept. 15th.
Wing Commanders.—Maj. (Temp. Lieut.-Col.) P. R. C. Groves, D.S.O., Shrops. L.I., from a Staff Officer, R.F.C., 1st Cl. (graded as an A.A.G.), and to retain his temp. rank whilst so employed; Capt. (Temp. Maj.) A. C. Boddam-Whetham, Arg. and Suth'd. Highrs., S.R., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Sept. 15th.
Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed:—Lieut. T. V. Hunter, Rif. Brig.; Sept. 30th. Temp. Lieut. G. A. Hyde, M.C., Gen. List; Oct. 3rd.
Flying Officers.—2nd Lieut. G. K. Rice-Oxley, A.S.C., S.R.; July 16th (substituted for notification in Gazette of Oct. 3rd). Lieut. W. J. A. Duncan, Canadian Railway Troops; 2nd Lieut. R. J. P. Cobb, W. Rid. R., and to be secd.; Temp. 2nd Lieut. (on prob.) A. Carter, Gen. List, and to be confirmed in his rank; Aug. 1st.
Balloon Officer.—2nd Lieut. T. C. Annan, Arg. and Suth'd. Highrs. (T.F.), and to be secd.; July 24th.
Equipment Officers, 1st Class.—Capt. A. L. Gregory, M.C., Dorset R., S.R., from the 2nd Cl. 2nd Lieuts. (Temp. Lieuts.), S.R., from the 2nd Cl., and to be Temp. Capts. whilst so employed:—R. T. Vernon, W. Hall, E. F. B. Curtiss; Oct. 1st.
2nd Class, from the 3rd Class.—Lieut. G. L. Godden, S.R., Sept. 1st; Lieut. H. B. FitzHerbert, S.R., and to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. W. E. Phillips, Gen. List, and Lieut. E. A. Molyneux, S.R., 2nd Lieut. M. F. A. Paine, S.R., Temp. 2nd Lieut. C. A. Stevenson, Gen. List, Temp. 2nd Lieut. S. McLaughlin, Gen. List; Oct. 1st.
General List.—Temp. 2nd Lieuts. (on prob.) confirmed in their rank:—J. Reekie, G. B. Moore.

Supplementary to Regular Corps.—2nd Lieut. C. H. Kitchen resigns his commission; Oct. 17th.

London Gazette Supplement, October 17th.

The following temp. appointments are made at the War Office:—
3rd Grade.—Major R. H. Howell, Ind. Cav., from a Flight Comdr., R.F.C., vice Capt. C. B. Krabbe, Vee. (T.F.); Sept. 15th.
The following appointments are made:—
Flight Commander.—Temp. Capt. G. E. F. Sutton, M.C., Can. Local Forces, from a Flying Officer; April 27th (substituted for the notification in the Gazette of Aug. 23rd).
Flying Officers.—2nd Lieut. H. V. Lewis, S. Wales Bord., and to be secd.; Sept. 13th. Temp. 2nd Lieut. D. A. Savage, Gen. List; Temp. 2nd Lieut. C. J. S. Dearlove, Gen. List, from a Flying Officer (Ob.), seniority from Feb. 24th; Sept. 19th. Temp. 2nd Lieut. (on prob.) T. S. Wilson, Gen. List, and to be confirmed in his rank; Sept. 21st. Temp. 2nd Lieut. (on prob.) J. J. Dawe, Gen. List, and to be confirmed in his rank; Sept. 22nd. Temp. 2nd Lieut. A. G. Cox, Gen. List, from an Equipment Officer, 3rd Cl., Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. W. Lowen, H. M. Lee, A. V. Price, C. S. L. Coulson, C. Bowman, C. F. Palmer; Sept. 23rd. T. H. L. Lewis, W. F. O. Trench; Sept. 24th. C. R. Maasdorp, G. S. Page, R. H. Topliss, W. G. Westwood, H. L. Holland; Sept. 25th. 2nd Lieut. (Temp. Lieut.) E. G. Green, M.C., R.E. (T.F.), from a Flying Officer (Ob.), seniority from Nov. 14th, 1916; Sept. 26th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. H. Gannaway, C. Gavaghan, J. H. Hartley, A. R. Spurling.
Instructor in Gunnery, graded as an Equipment Officer, 1st Class.—Lieut. G. E. Smith, E. York R., from Lieut. (Acting Capt.), M.G.C., to relinquish his acting rank, to be Temp. Capt. while so employed, and to be seconded; Sept. 25th.
Adjutant.—Temp. Capt. T. G. Bowler, Dorset R., vice Capt. Le G. G. W. Horton, K.R. Rif. C.; Oct. 1st.
General List.—Temp. 2nd Lieut. J. P. Cox to be Temp. Lieut.; July 1st. Temp. 2nd Lieut. (on prob.) R. R. Goding is dismissed the Service by sentence of a Gen. Court-martial; Sept. 30th. Sgt. A. J. Shaw, from R.F.C., to be Temp. 2nd Lieut.; Sept. 22nd.
Cadets to be Temporary 2nd Lieuts. (on probation).—C. J. Allen, J. W. Andrews, W. H. Arthur, J. V. Audas, W. A. Ball, J. H. Batten, F. G. Bayley, H. H. Beddow, R. H. Bourner, R. C. Bridges, R. C. Brown, A. W. M. Bryant, G. F. Burns, M. G. S. Burger, P. Bushell, A. A. Callaghan, A. C. Campbell, C. G. Carter, E. Cartwright, R. F. Caspareuth, C. Chambers, A. F. Chick, J. G. H. Crispin, L. G. Costa, R. N. Cresswell, A. L. Davies, A. S. J. Davies, E. I. Davies, J. Davies, H. F. Davison, T. R. Dawson, A. Deut, A. Devitt, D. L. Donaldson, J. F. Drake, M. J. Du Croy, W. E. Dumbell, R. R. Duncan, B. F. Dunford, P. L. Dunson, F. C. U. Dymant, J. A. Elliott, C. F. Embleton, G. Exley, J. E. Faid, R. J. Fleming, H. Forbes, L. S. Ford, T. W. Franks, J. Fulton, A. V. Gallie, J. C. Garlake, J. P. Gibbon, H. Goodwin, H. J. Goulding, W. H. L'E. Graham, J. S. Haigh, G. W. Hales, H. H. Hall, W. G. Hargrave, J. H. W. Haswell, J. A. Harkin, F. B. Harland, R. Hawkins, R. H. Hemmens, E. T. Hendrie, S. W. Highwood, F. Hill, T. S. Hill, D. V. Hodgson, J. R. Holden, B. Holding, R. H. Hollingdale, W. J. Hutchinson, B. Ingram, C. Jenkins, A. Johnson, O. P. Jones, F. J. Jones, C. A. Jordan, J. W. Kavanagh, W. Kellow, W. J. Kelsey, J. A. Kelynaack, L. W. King, E. A. Kinipple, G. A. Kinnmont, W. J. Knoll, G. E. B. Lawson, W. W. H. Lee, I. W. Leiper, F. L. C. Link, C. W. Lockett, J. C. Louw, A. E. Lundie, F. Lynn, C. C. Macdonald, C. W. G. McIntyre, M.C., B. J. McCutcheon, J. T. McKay, A. St. J. V. MacRae, G. G. Matthews, A. J. Maurer, C. W. Meredith, J. Milton, S. G. Minchin, A. C. Mitchell, C. E. Mitchell, B. H. Moody, S. Moxey, P. B. Myers, G. Nash, J. P. Naish, W. G. D. H. Nicol, O. H. Nicholson, E. J. Nicholls, H. L. Nichols, L. M. Nixon, J. L. O'Hagan, A. B. Ollerenshaw, F. H. Patten, A. A. Payne, F. J. Petherick, C. F. Phillips, A. Phillips, L. H. Phinney, R. N. Playford, W. N. Plenderleith, G. T. Polkinghorne, R. Pugh, C. J. Ramsbottom, B. Reunert, P. T. A. Reveley, J. G. Reynard, R. Ringrose, C. A. Robertshaw, C. F. Robinson, H. A. Rodger, G. D. Rowden, T. A. Royds, H. W. Russell, L. W. Savidge, H. J. Scott, H. C. W. Seovell, H. K. Scrivener, C. F. Secombe, R. J. Searle, W. Seddon, S. Sephton, C. J. Shackell, G. S. Shepherdson, A. Sheppard, G. E. Shipp, W. Sidebottom, C. W. Clarke, E. Snell, W. Sondheim, W. Spencer, R. H. Stainbank, A. M. Stahl, A. R. Stedman, A. L. Stockenstrom, R. W. Stoner, B. H. Stretton, C. S. Style, F. J. Suckling, W. A. Tait, F. Tattersall, J. D. Taylor, F. O. Thornton, C. R. Tolley, P. F. Townley, H. T. Townsend, T. C. Traill, J. C. L. Vigne, S. N. Waddy, L. G. Ward, V. U. T. Watson, E. R. Watt, R. W. Weatherby, R. N. Wellington, R. W. Whalley, C. H. Wheelock, J. T. White, A. H. Whitford-Hawkey, C. M. Whitman, S. F. Wilkin, A. Williamson, E. B. Wilson, G. D. Wilson, C. J. Winstanley, J. E. Wood, A. H. Wood, K. J. Woodgate, A. Wren, B. N. Wright, L. Young; Oct. 11th.
To be Temporary 2nd Lieuts. (on probation).—H. G. Baker; Aug. 7th. Cadet H. T. Cock, from R.F.C.; Sept. 15th. 2nd Lieut. Air-Mech. E. Harrison, from R.F.C.; Sept. 24th.
Supplementary to Regular Corps.—2nd Lieuts. (on prob.) confirmed in their rank:—E. F. Driver, W. L. Richards, N. J. Macdonald, W. Scatterly, J. G. Ryrie. 2nd Lieuts. to be Lieuts.:—J. B. Robinson, J. N. Mearns, E. F. Driver (Temp. Capt.), F. G. Hogarth (Temp. Lieut.), J. P. Rowell, C. I. Van Nostrand, A. W. Cott, F. G. Pinder, D. S. C. Macaskie, A. L. Curtis (Temp. Lieut.), H. L. Conner, G. Iredell (Temp. Capt.), A. H. O'H. Wood, (Temp. Capt.) H. J. D. Heenan, (Temp. Capt.) G. Jacques, (Temp. Lieut.) J. V. Nash, R. T. Griffin, E. H. Robinson, G. M. Murray, J. A. G. Gilroy; Sept. 1st. W. L. Richards, since placed on the retired list; N. J. Macdonald, C. W. Blain, G. L. Bond, T. L. Collins, R. F. Tindall, (Temp. Capt.) E. A. McKay, M.C., R. E. A. Macbeth, E. Laurie, W. Scatterly, J. G. Ryrie (Temp. Capt.) L. R. Kerridge, H. W. Norman (Temp. Lieut.) H. J. Poole, (Temp. Lieut.) E. W. Bowen, (Temp. Capt.) B. M. Iles, (Temp. Lieut.) H. I. Hughes, G. R. McCubbin, D.S.O., C. G. Sweet; 2nd Lieut. R. F. Anderson resigns his commission; Oct. 18th.
London Gazette Supplement, October 18th.
The following appointments are made:—
Flight Commanders.—From Flying Officer, and to be Temp. Capts. whilst so employed:—Temp. 2nd Lieut. A. B. Cook, Gen. List; Oct. 2nd. Temp. Lieut. W. A. L. Poundall, M.C., S. Lan. R.; Oct. 4th. Temp. 2nd Lieut. N. E. Barraclough, M.C., Gen. List; Oct. 5th.
Flying Officers.—Temp. 2nd Lieut. (on prob.) G. M. Stephenson, Gen. List, and to be confirmed in his rank; Aug. 8th. Temp. 2nd Lieut. A. J. Shaw, Gen. List; Sept. 22nd. 2nd Lieut. G. Hall, Lond. R. (T.F.), from a Flying Officer (Ob.), seniority from Dec. 31st, 1916; Temp. 2nd Lieut. (on prob.) C. G. D. Napier, Gen. List, and to be confirmed in his rank; Sept. 23rd. Lieut. R. G. Atkinson, Canadian Gen. List, Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. H. Warton, R. H. Harmer, E. F.

Marchand, J. R. Fuller; Sept. 24th. C. E. Mayer, H. P. Blakely, G. A. Park, W. G. Redman; Sept. 25th. Temp. Lieut. W. H. Buckridge, Gen. List, from a Flying Officer (Ob.), seniority from May 2nd, 1916; Temp. 2nd Lieut. L. W. Middleton, Gen. List, from a Flying Officer (Ob.), seniority from Jan. 15th; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. G. Scobie; Sept. 26th. G. L. Hobbs, F. Belway, F. A. Lewis, E. R. Longhurst; Sept. 27th. Temp. 2nd Lieut. V. C. Manuel, Gen. List, from a Flying Officer (Ob.), seniority from Oct. 10th, 1916; 2nd Lieut. (on prob.) J. A. Cote, S.R.; Temp. 2nd Lieut. (on prob.) P. K. Hobson, Gen. List, and to be confirmed in his rank; 2nd Lieut. (on prob.) F. H. Hall, S.R.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—D. Adams, L. D. Sisley, H. E. Robinson, F. E. Godfrey, S. Jones; Sept. 28th. Temp. 2nd Lieut. (Temp. Lieut.) T. H. Trew, Gen. List, from a Flying Officer (Ob.), seniority from March 11th, 1916. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—E. S. Robins, J. Hetherington.

Flying Officers (Observers).—Lieut. R. C. Morgan, Canadian Art., from an Adj., R.F.C.; May 28th, seniority from Oct. 21st, 1915. Temp. 2nd Lieut. W. J. Pearson, Gen. List; Feb. 13th, seniority from Jan. 2nd. Temp. 2nd Lieut. (on prob.) H. A. Cooper, Gen. List, seniority from July 15th, and to be confirmed in his rank. Temp. 2nd Lieut. H. J. Buist, R.W. Surr. R., seniority from July 17th; Sept. 28th.

Sept. 27th, seniority from Aug. 15th:—Temp. 2nd Lieut. V. St. B. Collins, Gen. List; Temp. 2nd Lieut. (on prob.) J. Frost, Gen. List, and to be confirmed in his rank; Sept. 28th, seniority from Aug. 21st. Temp. 2nd Lieut. G. R. Horsfall, York and Lanc. R., and to be transf'd. to R.F.C., Gen. List; Temp. 2nd Lieut. (on prob.) E. F. Dixon, Gen. List, and to be confirmed in his rank. Sept. 27th, seniority from Aug. 22nd:—Temp. 2nd Lieut. J. E. Mott, R. Ir. Fus.; Temp. 2nd Lieut. (on prob.) F. Crossley, Gen. List, and to be confirmed in his rank.

Balloon Commander, graded as a Balloon Officer.—Temp. Capt. J. C. Wooley-Dod, Gen. List, from a Balloon Officer; Oct. 1st.

Adjutants.—Capt. R. C. Burton, Yeo. (T.F.), and to be sec'd.; Aug. 7th. Capt. Sir W. P. C. Lethbridge, Bt., G. Gds.; Sept. 14th.

Depot Commander.—Capt. (Temp. Major), A. V. Bettington, S.R., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Aug. 7th.

Special Appointment, graded as an Equipment Officer, 1st Class.—Capt. G. P. Burrell, M.C., Hamps. R. (T.F.), from an Equipment Officer, 3rd Cl.; Sept. 22nd.

Equipment Officers, 2nd Class.—From the 3rd Class.—Temp. 2nd Lieut. E. Drudge, Gen. List, and to be Temp. Lieut. whilst so employed; June 1st. Lieut. F. W. H. Lerwill, S.R.; Sept. 29th. 2nd Lieut. J. S. Reid, S.R., and to be Temp. Lieut. whilst so employed; Oct. 1st. 3rd Cl.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. G. Baker; Aug. 7th. M. A. Miller; Sept. 11th. Temp. 2nd Lieut. N. Openshaw, Gen. List, from a Flying Officer; Sept. 18th. Temp. 2nd Lieut. G. G. Hargrave, Leic. R., and to be transf'd. to R.F.C., Gen. List; Temp. 2nd Lieut. (on prob.) A. Honey, Gen. List, and to be confirmed in his rank; Lieut. F. W. H. Lerwill, S.R., from a Flying Officer; Sept. 22nd. 2nd Lieut. (Temp. Lieut.) G. H. C. Crooke-Rogers, Worc. R., from a Flying Officer; Sept. 25th. Temp. 2nd Lieut. (on prob.) W. A. Lyon, Gen. List, and to be confirmed in his rank; Sept. 29th. Qr.-Mr. and Hon. Lieut. E. J. Langridge, N. Staff. R.; Oct. 1st.

General List.—Qr.-Mr.-Sgt. A. C. Hill to be 2nd Lieut.; Aug. 3rd. Temp. 2nd Lieut. (on prob.) P. G. Bankart is dismissed the Service by sentence of a Gen. Court-Martial; Oct. 3rd. Staff Sgt. A. C. Geen, from School of Musketry, Bisley, to be Temp. 2nd Lieut. (on prob.); Aug. 29th.

London Gazette Supplement, October 19th.

The following appointments are made:—

Staff Officer, R.F.C., 2nd Class.—(Graded for purposes of pay as a G.S.O., 2nd Grade, at the War Office).—Capt. R. B. Bourdillon, M.C., S.R., from a Flight Comdr.; Sept. 21st.

Flight Commander.—Lieut. (Temp. Maj.) the Hon. O. M. Guest, Yeo. (T.F.), to revert from a Sqdn. Comdr., to relinquish his temp. rank and to be Temp. Capt. whilst so employed; Oct. 1st, seniority Nov. 21st, 1915.

Flying Officers.—Lieut. S. A. Rutledge, Can. Inf.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. E. Windower; Sept. 25th. J. M. Nichol, L. W. Mawbey, A. F. Peacey; Capt. J. G. Stewart, M.C., New Zealand A.S.C.; 2nd Lieut. F. R. Walker, Midd'x R., S.R., from Temp. Lieut., M.G. Corps; 2nd Lieut. H. C. R. Owen, Yeo. (T.F.), and to be sec'd. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank:—F. M. MacFarland, F. J. McConnell; Sept. 27th. E. R. Varley; Temp. 2nd Lieut. E. R. Danks, Gen. List, from an Equipment Officer, 3rd Class; 2nd Lieut. (on prob.) L. J. Balderson, S.R., Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—T. Ivison, P. J. Clayton; Sept. 28th. Temp. Capt. J. L. Findlay, M.C., attd. E. Surr. R., and to be transf'd. to R.F.C., Gen. List. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. Bursey, R. Siddall, R. H. Edleston, A. C. Tallent, J. Cottle, A. A. McLeod, H. S. Morton; Sept. 29th. F. W. Butt, C. S. Challoner, V. P. Long, W. Q. N. Richardson, M. G. Taylor, F. St. P. Harran; Sept. 30th.

Flying Officers (Observers).—2nd Lieut. L. W. Heath, R.F.A., S.R., seniority from July 23rd. Lieut. G. C. Langford, Can. Art., seniority from Aug. 7th. 2nd Lieut. G. C. E. Smitheth, North'n R.; Sept. 28th, seniority from Aug. 22nd, and to be sec'd. (Sept. 29th); Sept. 28th, seniority from Aug. 23rd; Temp. 2nd Lieut. L. P. Sidney, K.R. Rif. C., and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. H. Pughe-Evans, Welsh R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. E. P. Hartigan, R. Muns. Fus.; Temp. 2nd Lieut. S. B. H. Coppard, A.S.C., and to be transf'd. to R.F.C., Gen. List; Sept. 28th, seniority from Sept. 3rd.

Assistant Instructor in Gunnery.—(Graded as an Equipment Officer, 3rd Class).—Lieut. T. N. Weguelin, Hamps. R. (T.F.), and to be sec'd.; Oct. 5th. **Adjutants.**—Capt. S. M. Pearce, Leic. R. (T.F.); Sept. 17th. Capt. F. W. I. V. Fraser, M.C., Seaf. Highrs.; Oct. 3rd.

Park Commander.—2nd Lieut. (Temp. Capt.) E. Bush, W. Rid. R., from an Equipment Officer, 1st Class, and to be Temp. Maj. whilst so employed; Aug. 22nd.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. (on prob.) G. F. Kite, Gen. List, and to be confirmed in his rank; Aug. 29th. Temp. Lieut. G. W. Colmer, A. Ord. Dept., and to be transf'd. to R.F.C., Gen. List; Sept. 26th.

Schools of Instruction.—**Schools of Military Aeronautics.**

Assistant Instructor (Graded as an Equipment Officer, 2nd Class).—Temp. 2nd Lieut. M. A. Millar, Gen. List, from an Equipment Officer, 3rd Class, and to be Temp. Lieut. whilst so employed; Sept. 12th.

General List.—Temp. Lieut. (Temp. Maj.) G. R. Moser, Arg. and Suth'd Highrs., to be Temp. Lieut.-Col. whilst Comdt. (graded as a Depot Comdr.) of a School of Aerial Gunnery; Aug. 1st. Temp. 2nd Lieuts. to be Temp. Lieuts.: H. C. Vickery; July 1st. D. Hamilton; Aug. 5th; Temp. 2nd Lieut. J. Blacklaws relinquishes his commission on account of physical unsuitability as a pilot or observer; Temp. 2nd Lieut. L. Renton resigns his commission; Oct. 20th. Flight Sgt. R. Scoon, from R.F.C., to be Temp. 2nd Lieut.; Sept. 30th. To be Temp. 2nd Lieuts. (on prob.):—Corpl. V. W. Lawson, from R.F.C.; Sept. 25th. Sgt. J. Mytton, from H.A.C. (T.F.); Sept. 27th. Sgt. E. V. T. Knight, from R.F.C.; Oct. 5th.

Supplementary to Regular Corps.

Lieut. (Temp. Capt.) A. M. Low relinquishes his commission on appointment to R.N.V.R.; Oct. 2nd. 2nd Lieut. J. W. G. Boyd relinquishes his

commission on account of physical unsuitability as a pilot or observer; 2nd Lieut. (on prob.) A. D. Matheson resigns his commission; Oct. 20th.

The following temporary appointments are made at the War Office:—

London Gazette Supplement, October 20th.

Director.—Capt. (Temp. Lieut.-Col. F. C. Jenkins, R.F.C., S.R., from an Asst. Director, and to be Temp. Brig.-Gen. whilst so employed; Aug. 31st.

Deputy Director.—Capt. (Temp. Lieut.-Col.) C. H. Whittington, R.F.C., S.R., from an Asst. Director, and to be Temp. Col. whilst so employed; Aug. 31st.

Assistant Director.—Temp. Capt. R. H. Austin-Sparks, Gen. List, from a Dep. Asst. Dir., and to be Temp. Lieut.-Col. whilst so employed, vice Capt. (Temp. Brig.-Gen.) F. C. Jenkins, R.F.C., S.R.; Aug. 31st.

Deputy Assistant Directors.—Temp. Lieut. (Temp. Capt.) R. W. Roylance, Gen. List, from a Staff Capt., and to retain his temp. rank whilst so employed. Temp. Capt. W. H. Ewen, Gen. List, from a Staff Capt., vice Temp. Capt. (Temp. Lieut.-Col.) R. H. Austin-Sparks, Gen. List; Temp. Capt. K. G. S. Hatfield, Gen. List, from a Dep. Asst. Dir. (graded as a Staff Capt.); Aug. 31st.

Staff Captain.—Maj. A. R. Leith, K.R.R.C.; Oct. 1st.

Staff Lieutenant.—J. B. Walker, and to be Temp. 2nd Lieut.; Aug. 24th.

The following appointments are made:—

Flight Commanders.—Lieut. I. A. J. Duff, Dorset R. (T.F.), from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 12th (substituted for notification in *Gazette* of Sept. 26th). From Flying Officers, and to be Temp. Cpts. whilst so employed:—2nd Lieut. (Temp. Lt.) M. Thomas, Welsh R. (T.F.); July 29th. Lieut. G. E. W. Hitchcock, R.E., S.R.; 2nd Lieut. C. F. Davies, R. Highrs. (T.F.); Oct. 5th.

Flying Officers.—Temp. 2nd Lieut. W. H. Goodbrand, Gen. List; Sept. 12th. Temp. 2nd Lieut. (on prob.) G. T. Williams, Gen. List, and to be confirmed in his rank; Sept. 17th. Lieut. E. K. Skelton, Can. Art.; Sept. 18th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. J. Greenslade; Sept. 19th. J. A. Butler; Sept. 22nd. H. F. Longbottom; Sept. 23rd. E. G. Chance; Sept. 25th. S. G. McNaught-Davis, L. G. Norton, J. H. Cremonini, A. J. Haines, W. G. Clark, E. A. F. Reeve, A. W. Blake, 2nd Lieut. W. Dancy, R.G.A., S.R.; Sept. 26th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—E. M. Meredith, D. C. Doyle, H. K. Spoonley, Lieut. F. H. Stephens, Can. Inf. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. W. Milner, F. E. Diddcott, J. Francis, S. H. W. Gibbs, A. D. Pope, C. W. N. Raymond, Temp. Lieut. W. C. Taylor, M.G. Corps, and to be transf'd. to R.F.C., Gen. List. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. J. F. Shannaw, C. Bell. Temp. Lieut. L. R. L. Brown, Gen. List, from a Flying Officer (Obs.), seniority Oct. 17th, 1916; Sept. 27th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—D. G. Gbld, E. Thomas, E. W. Fleming, W. K. Crewe, from a Flying Officer (Obs.), seniority Dec. 8th, 1916; F. B. Wilson; Temp. 2nd Lt. T. W. George, Gen. List, from a Flying Officer (Obs.), seniority Nov. 24th, 1916; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—S. R. Hanafy, H. V. Ellis, W. Sidebottom. Temp. Lieut. R. D. Caley, Gen. List, from a Flying Officer (Obs.), seniority Nov. 26th, 1916. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. F. Macpherson, A. R. Cross, J. D. Scott; Sept. 28th. T. F. Plicher, L. J. Trounce, J. J. Gowing. Temp. Capt. H. Ward, Garr. Bn. North'd Fus., and to be transf'd. to R.F.C., Gen. List. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—F. C. Ransley, W. Hardy, H. C. McClelland, A. F. Alexander, F. W. Kemp, W. G. MacKenzie, B. D. Clark; Sept. 29th. Temp. 2nd Lieut. R. Scoon, Gen. List; Temp. 2nd Lieut. (on prob.) C. W. Robinson, Gen. List, and to be confirmed in his rank; 2nd Lieut. H. R. Hawkins, Hrs., and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. Daniel, E. S. Davenport, H. McDonald; Sept. 30th. F. Duffy, L. N. Gaskell, H. C. W. Walters, T. N. O'Galligan, C. P. Virgo, A. G. Grose; Oct. 1st. The appointment of Temp. 2nd Lieut. A. H. Stead, Gen. List, notified in *Gazette* of Oct. 10th, is antedated to Aug. 17th.

Flying Officers (Observers).—Lieut. R. H. Le Lieuvre, Can. Inf. (Oct. 2nd, seniority April 6th); 2nd Lieut. J. M. McL. Hume, R. Highrs. (T.F.), and to be sec'd.; Sept. 30th, seniority July 5th. 2nd Lieut. C. S. Heaton, North'd Fus. (T.F.), and to be sec'd.; Oct. 2nd, seniority July 22nd. Oct. 2nd, seniority Aug. 6th:—Temp. 2nd Lieut. V. H. G. Parker, R.A., and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. R. B. L. Taylor, S. Lan. R., S.R., and to be sec'd.; 2nd Lieut. F. G. Sawyer, R.F.A., S.R. Oct. 2nd:—Temp. 2nd Lieut. F. H. Shales, attd. D. of Corn. L.I. seniority Aug. 15th, and to be transf'd. to R.F.C., Gen. List; Temp. 2nd Lieut. (on prob.) Z. S. Marsh, Gen. List, seniority Aug. 23rd, and to be confirmed in his rank; 2nd Lieut. R. M. Penman, High. L.I. (T.F.), seniority Sept. 5th, and to be sec'd.

General List.—Temp. 2nd Lieut. L. W. Balch resigns his commission; Oct. 21st. Sgt. W. H. Goodbrand, from R.F.C., to be Temp. 2nd Lieut.; Sept. 12th. To be Temp. 2nd Lieuts. (on prob.):—C. B. Pensotti, L. A. T. Power, A. Hill, H. J. Child, C. C. V. Roebuck, A. A. Dolphin, W. H. Saunders; Oct. 19th.

Memorandum.—Temp. 2nd Lieut. G. F. Campbell, Gen. List, relinquishes his commission on ceasing to serve with R.F.C., and is granted the hon. rank of 2nd Lieut. Sept. 15th.

General List (R.F.C.).—The following cadets to be Temp. 2nd Lieuts. (on prob.):—H. Croudace, F. H. Knobel, T. J. Gillow; Aug. 16th. N. T. Berrington, W. H. Seward, H. M. Stewart, J. H. Taylor, A. E. Thornhill, J. Q. F. Walker; Sept. 3rd. G. De Gaye, E. A. Doughty, M. G. Epstein, L. M. Fendon, A. Ferris, J. A. Gilchrist, C. G. Hinder, A. S. Kynoch, W. Mahony, W. J. N. Morrisby, M. Mullen, W. M. Phillips, R. G. Pierce, J. A. Pouchot, N. R. Scully, H. J. Selley, R. E. M. Worsley; Sept. 6th. C. R. Ball, W. F. Booth, F. S. C. Buchanan, G. A. Cooper, C. Davies, A. J. Dunton, T. W. Gowland, M. D. Grainger, H. G. F. Murray; Sept. 7th.

London Gazette Supplement, October 22nd.

The following appointments are made:—

Flying Officers.—Temp. 2nd Lieut. (on prob.) L. W. St. George, Gen. List, and to be confirmed in his rank; July 11th. Temp. 2nd Lieut. L. L. Leleu, D. of Corn. L.I.; July 28th. 2nd Lieut. F. S. Vaughan, R.W. Kent R. (T.F.), and to be sec'd.; Aug. 3rd. 2nd Lieut. E. S. Dowdall, Lond. R. (T.F.), and to be sec'd.; Aug. 7th. 2nd Lieut. (on prob.) C. N. Le Mercier, S.R.; Aug. 12th. Temp. 2nd Lieut. H. G. Hall, L'pool. R., and to be transf'd. to R.F.C., Gen. List; Aug. 15th. Temp. 2nd Lieut. (on prob.) P. A. A. Boss, Gen. List, and to be confirmed in his rank; Aug. 17th. Capt. A. C. McKelvie, Yeo. (T.F.), and to be sec'd.; Aug. 19th. Temp. 2nd Lieut. E. E. G. Nicholson, R.A., and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. A. Richardson, Yeo. (T.F.), and to be sec'd.; 2nd Lieut. D. B. Cumming, Ind. Army Res. of Off.; Aug. 20th. 2nd Lieut. J. D. Davidson, K.O. Sco. Bord., S.R., and to be sec'd.; Aug. 21st. Lieut. F. H. Miles, Yeo. (T.F.), and to be sec'd.; Aug. 22nd.

Temp. 2nd Lieutenants (on prob.), Gen. List, and to be confirmed in their rank:—K. B. Davies; Sept. 18th. R. J. Moore, M. H. Orcutt, A. S. Rieming; Sept. 27th. J. W. Richards, C. D. Skinner, J. E. Yates, F. W. Clark; Sept. 28th. F. A. Nethercott, C. G. Tysoe, J. MacG. Fairweather, J. Prentice; Sept. 29th. Temp. Lieut. E. Burney, M.C., Gen. List, from a Flying Officer (Obs.), seniority Nov. 25th, 1916; Temp. 2nd Lieut. J. E. Middleton, Gen. List, from a Flying Officer (Obs.), seniority Jan. 21st.

Temp. 2nd Lieutenants (on prob.), Gen. List, and to be confirmed in their rank:—J. Baird, S. Grossberg, R. E. Norman, E. Edgar, H. Walsh, R. C.

Pigott, H. Wild, F. M. Ohrt, B. P. Russell, L. W. D. Tratman, T. St. C. Douglas, J. A. Dear, R. H. Williams, F. W. Bethell, C. B. Banfield, N. U. Harvey; Sept. 30th. A. T. Partridge, N. E. Parkes; Oct. 1st. 2nd Lieut. (on prob.) A. J. Stopford, S.R.; 2nd Lieut. E. F. J. Bull, Worc. R., and to be sec'd.; Oct. 2nd.

Temp. 2nd Lieutenants (on prob.) Gen. List, and to be confirmed in their rank:—W. R. F. Stokes, A. de Teissier, J. A. C. Kempe-Roberts, R. A. Cartledge, E. Lindup, D. G. Lewis; Oct. 3rd. The appointment of Capt. J. I. C. O. Gairdner, R. Highrs. (T.F.), notified in the *Gazette* of July 20th, is antedated to May 25th.

Special Appointment.—(Graded as a Park Commander).—Temp. Lieut. L. Legge, Gen. List, from a Special Appointment (graded as an Equipment Officer, 2nd Class), and to be Temp. Maj. whilst so employed; Oct. 8th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. (on prob.) E. Bagshaw, Gen. List, and to be confirmed in his rank; Aug. 25th. The appointment of Temp. 2nd Lieut. (on prob.) H. G. Gregory, Gen. List, notified in the *Gazette* of Sept. 17th, is antedated to June 19th.

General List.—Actg. Sgt.-Maj. S. T. Kemp to be 2nd Lieut.; Aug. 28th Temp. 2nd Lieut. V. A. Barbeau relinquishes his commission on account of physical unsuitability as a Pilot or Observer; Oct. 23rd. Temp. 2nd Lieuts. resign their commissions:—G. D. Addison, C. R. Moore; Oct. 23rd. Temp. 2nd Lieuts. (on prob.) confirmed in their rank:—C. M. Woolger, G. S. Rogers, N. P. Davis, G. R. Barry, J. J. Ironmonger, R. S. V. Morris, N. McLeod. To be Temp. 2nd Lieuts. (on prob.):—O. J. W. Napier; Oct. 1st. C. P. E. Cheffins, A. W. Rippon, C. H. Clarke, J. J. Speer, R. Braine, T. H. Baxter, W. H. Spann, W. F. Wallace, H. B. Long, C. H. Greenhouse, S. Barron, E. J. Cox, F. R. Johnson, E. F. Fardon, H. C. Bird; Oct. 19th.

Supplementary to Regular Corps.

2nd Lieuts. (on prob.) are confirmed in their rank:—W. F. Warner, L. Balderson.

General List (R.F.C.).—Cadet J. W. A. Legge-Willis to be Temp. 2nd Lieut. (on prob.); Sept. 4th. (Substituted for *Gazette* notification Sept. 11th, incorrectly describing surname as Willis.)



AIRCRAFT WORK AT THE FRONT. OFFICIAL INFORMATION.

British.

General Headquarters, October 16th.

"During the morning of the 15th inst. much successful artillery work was accomplished by our aeroplanes, many photographs were taken, and the enemy's infantry were harassed with machine-gun fire from low altitudes. In the course of the day two tons of bombs were dropped by us on a large German ammunition dump near Courtrai and on hostile billets and hutments in the battle area. A number of bombs were dropped by night also on various targets in the enemy's forward areas. In air fighting three German machines were brought down and two driven down out of control. Three of our machines are missing."

Admiralty, October 16th.

"A considerable number of patrols were carried out yesterday by naval aircraft, in the course of which several enemy aeroplane formations were encountered. Two of the enemy machines were driven down. One of our machines is missing. During the 24 hours bombing raids were carried out on the following objectives: Bruges Docks, Varssewaere Aerodrome, Houttave Aerodrome. Large quantities of explosives were dropped with good effect, all our machines returning safely."

Admiralty, October 17th.

"On the night of October 15th-16th a bombing raid was carried out by naval aircraft on Bruges Dock, on which objective many tons of bombs were dropped. During October 16th one of our fighter patrols brought down a two-seater enemy machine in the vicinity of Zartren. The observer was seen to fall out, and the machine turned over and fell, on fire. All our machines returned safely."

War Office, October 17th.

"**At esepolamie.**—On October 16th our aeroplanes dropped bombs on a Turkish aerodrome at Kifri, 50 miles north of Sharaban, doing much damage. On the return journey one of our aeroplanes was forced to land, and had to be burnt, but the occupants were brought in by other machines."

General Headquarters, October 17th.

"British aeroplanes carried out a successful bombing raid this afternoon into German territory. A factory west of Saarbrücken, some 40 miles beyond the German frontier, were attacked. Many bombs were dropped with good effect, and fires were seen to break out in the factory. All of our machines returned safely. On the 16th inst. our aeroplanes took advantage of the fine period from dawn until three p.m. to carry out artillery work and photography. A large number of bombs were also dropped during the day on hostile billets, hutments, and trenches. Two German machines were brought down in air fighting, and another was shot down by our anti-aircraft guns. One of our machines is missing."

Admiralty, October 18th.

"During the day (October 17th) patrols were carried out by the Royal Naval Air Service, several enemy formations being encountered. One enemy seaplane was brought down and seen to crash, while two other enemy machines were probably destroyed."

War Office, October 18th.

"Two hostile aeroplanes have been brought down in our lines recently."

General Headquarters, October 18th.

"On the 17th inst. the fine weather produced great aerial activity. Visibility was excellent, and enabled our machines to do a great deal of successful artillery work and photography. Ninety-eight bombs were dropped by our aeroplanes during the day on the enemy's billets and hutments. The strong west wind and clear atmosphere were ideal for the enemy's artillery reconnaissance and fighting machines, which were active and very aggressive in the forenoon. Several flights were made at high altitudes over our lines, with the result that of the enemy machines brought down by our aeroplanes three fell in our territory. In all 11 German machines were brought down by us, including one shot down by anti-aircraft gunfire, and four others were driven down out of control. Three of our machines are missing."

Admiralty, October 19th.

"On the morning of the 18th inst. a bombing raid was carried out by naval aircraft on Varssewaere Aerodrome. Many bombs were dropped with satisfactory results. All our machines returned safely."

General Headquarters, October 19th.

"On the 18th inst. the early morning was brilliantly fine, but at 9 a.m. low, thick clouds drifted up from the west. Reconnaissances, artillery work, and photography were carried out by our aeroplanes, and in the course of the day 2½ tons of bombs were dropped on a large gun position near Doai, on railway sidings near Ghent, and on various billets and hutments."

"At night a further ton of bombs were dropped by us on Courtrai station and on the German aerodrome in that vicinity."

"In air fighting six hostile machines were brought down and four were driven down out of control. Another German machine was shot down by anti-aircraft gunfire. Seven of our machines are missing."

General Headquarters, October 20th.

"On the 19th inst. dense mist almost entirely prevented aerial work. At little artillery work was carried out by our aeroplanes, and 50 bombs were dropped by us on various targets. There was very little improvement in the weather during the night, but a few bombs were dropped on a hostile railway station. No fighting took place during the day."

General Headquarters, October 21st.

"In spite of very misty weather, a further attack into Germany was carried out by our aeroplanes this afternoon. A foundry and railway junction ten miles north-west of Saarbrücken were bombed, over a ton of bombs being dropped. Very good results were observed, and bursts were seen on the foundry and railway station. A big explosion took place. Many hostile scouts attacked the bombing squadrons over the objective, and four were driven down out of control. Photographs were taken by us. All our machines returned except one."

Admiralty, October 21st.

"On the night of Oct. 19th and during the morning of the 20th, bombing raids by naval aircraft were carried out on the following military objectives:—Bruges Dock, Engel Aerodrome. A fire is reported to have broken out at the latter place. Large quantities of explosives were dropped. All machines returned safely."

Admiralty, October 22nd.

"At about noon on October 21st raids were carried out by naval aircraft on Vlissinghem Aerodrome and on Houttave Aerodrome. The bombs appeared to burst accurately. Both during the raids and on the return our bombing machines were attacked by enemy aircraft, two of which were shot down completely out of control. Our bombers all returned safely. During offensive and reconnaissance patrols five of our scouts engaged about 20 hostile scouts, two of the latter being destroyed, and two driven down completely out of control. One of our pilots is missing."

"Naval works at Ostend were bombarded by our ships on October 21st, and photographs show the results were satisfactory."

French.

Paris, October 16th.

"German aircraft last night bombarded the region of Dunkirk. There were no victims, and no material damage was done."

Paris, October 17th.

"Towards 7 p.m. enemy aeroplanes violently bombarded Nancy. A number of casualties are reported among the civil population (10 killed and about 40 wounded)."

"Yesterday and the day before five German aeroplanes were destroyed, four by our pilots and one by our anti-aircraft guns. Moreover, 20 enemy machines fell out of control into their own lines after air fights. Our bombing machines carried out different flights. The military establishments of Volklingen, the railway stations of Thionville, Maizières-les-Metz, and Metz-Woippy, the factories of Hagondange and those of Rombach received a large number of bombs."

Paris, October 18th.

"Yesterday evening, about 6.30, enemy aeroplanes made a new raid on Nancy and dropped some bombs, causing victims among the civilian population."

"In the course of yesterday six German aeroplanes were destroyed, and five fell out of control into their own lines."

"Our bombarding squadrons made several raids. The railway stations of Courcelles, of Thionville, of Mezières, of Noveant, and of Waville, the factories at Hagondange and numerous munition depôts and bivouacs were freely bombed."

Paris, October 19th.

"In the region of Dunkirk during the night about 20 bombs were dropped by aircraft. No victims have been reported."

"During the day of Oct. 18th two German aeroplanes were brought down by the 51st Section of Motor Guns."

Italian.

Rome, October 19th.

"Particular mention must be made of the maritime aerial activity during the day of October 16th in the Upper Adriatic. Groups of mine sweepers and torpedo-boats having been observed since the morning off the Istrian coast between Trieste and Rowigno, squadrons of our seaplanes proceeded to attack them, compelling them to abandon their operations and to seek refuge in their ports."

"We also bombarded the aviation station of Parenzo (midway between Trieste and Pola, on the Istrian coast), and an enemy submarine, which was observed to the west of this locality. In the course of numerous encounters with enemy machines, which rose to drive off our attacks, an enemy seaplane was obliged to descend. We sustained no losses."

Russian.

Petrograd, October 17th.

"Profiting by the calm and bright weather, the enemy has been actively engaged in aerial scouting, principally in the region of the Baltic islands. Our aviators ascended to meet the enemy. In an aerial engagement our aviator Safonoff brought down an enemy machine, which fell in our lines. A Zeppelin flew over the Moon Sound."

"In the night of October 16th-17th a Zeppelin flew over the town of Pernau and dropped bombs. Six houses were destroyed."

"**Baltic Sea.**—Simultaneously (with the attack on the Moon Sound) a great number of the enemy aircraft dropped many bombs on our ships, and on the harbours of the islands still occupied by our detachments. In these aerial engagements our aviator Lieut. Safonoff brought down another machine."

German.

Berlin, October 17th.

"By way of reprisal for the dropping of bombs by enemy aviators on open German towns, bombs have been dropped by us on the town of Nancy, lying within the region of French operations. Large fires resulted."

"Naval airships dropped bombs on Pernova, where large fires broke out."

Berlin, October 18th.

"Thirteen aeroplanes were brought down yesterday. In reply to the aerial attack on Frankfurt, bombs were again dropped on Nancy."

Berlin, October 19th.

"Our opponents lost yesterday 12 aeroplanes, six of which were out of a squadron which had dropped bombs on Roulers and Ingelmunster, with considerable damage to houses."

"**Baltic.**—Military and naval airmen kept the commanders well informed as to the whereabouts of enemy forces. Both on land and sea they several times attacked the enemy with perceptible success, using bombs and machine-gun fire."

Berlin, October 21st.

"Nine enemy aviators have been shot down."

Bulgarian.

Sofia, October 17th.

"There was lively aerial activity along the Struma. German airmen brought down in the course of aerial fighting two enemy aeroplanes. One fell behind our positions."

AVIATION IN PARLIAMENT.

R.F.C. Mechanics.

MAJOR TERRELL, in the House of Commons on October 19th, asked the Under-Secretary of State for War whether men who have enlisted in the Royal Flying Corps as mechanics are put to their election either to enlist for eight years or to be transferred to an infantry battalion?

Mr. Macpherson: The answer to my hon. and gallant friend's question is in the negative.

Air Raids and Bombardment Insurance Scheme.

MR. FELL, on October 22nd, asked the President of the Board of Trade if he can state the amount of premiums received by the Government for insurance against damage to property by air raids and the amount against damage by bombardment from the sea?

The Parliamentary Secretary to the Board of Trade (Mr. Wardle): I do not think it would be desirable in the public interest to publish the figures relating to any of the Government insurance schemes at present.

Mr. Fell: With an insurance scheme like this, should the figures be kept secret? Would it not reassure the people if they knew there was a big sum of £8,000,000 available for their losses?

Mr. Wardle: It is not considered desirable in the public interest at present.

Pay of R.F.C. Pilots.

MAJOR DAVIES asked the Under-Secretary of State for War whether he is aware that the Canadian Government contracts with pilots in the Royal Flying Corps for a definite period at the end of which they are given a first-class fare to Canada; whether it is open to them to enter into a fresh contract with the United States Government, which offers a very high rate of pay for fully qualified pilots; and whether he proposes to take any action in the matter in the interest of the British services?

Mr. Macpherson: I am informed that no contracts of the kind alluded to have been made by the Canadian Government with pilots in the Royal Flying Corps. The second part of the question does not, therefore, arise.

Zeppelin Raid (Compensation).

MR. W. THORNE asked the Prime Minister whether he is aware that during the recent enemy air raids some bombs were dropped in one of the East London cemeteries and damaged a number of graves and tombstones; and whether the Government will make the damage good by way of compensating the owners of small private graves?

Sir G. Cave: If the hon. member will cause particulars of the damage to be sent to the Treasury, the question of granting compensation from public funds will be considered as soon as the details of the new Government Aircraft Insurance Scheme have been settled.

Regular Soldiers and R.F.C. Commissions.

MR. CROOKS asked the Under-Secretary of State for War whether time-serving soldiers in the Regular Army are eligible for temporary commissions in the Royal Flying Corps; and, if not, will he state the grounds upon which they are excluded?

Mr. Macpherson: They are eligible for temporary commissions on the general list for service with the Royal Flying Corps, subject to their acceptance of certain conditions.

The Zeppelin Raid.

MR. JOYNSON-HICKS (by Private Notice) asked the Prime Minister whether he had any further statement to make regarding the apparent lack of defence against the Zeppelin raid on Friday night, and whether he is in a position to make a definite statement as to a counter-invasion of Germany by air?

Sir G. Cave: My right hon. friend has asked me to reply to this question. The raid on Friday night appears to have been carried out by ten or more Zeppelins. Of these, five only reached the neighbourhood of London, the remainder failing entirely to reach their objective, and leaving the country without causing material damage. Of the five Zeppelins which came near to London, four failed to penetrate the London defences, and did no damage. The remaining Zeppelin drifted over London with her engines shut off and dropped three bombs at intervals, causing loss of life. A number of our aeroplanes went up, but, owing to the atmospheric conditions, which were most unfavourable both for attack and defence, they were unable to bring the raider to action. The House is aware that a number of the raiders drifted over France and that four at least have been definitely accounted for by the French forces. Information as to the others is still awaited, and will be published as soon as received. The greatest possible credit is due to the French airmen and the anti-aircraft artillery for their splendid performance, but in justice to the British anti-aircraft forces, it should be remembered that the airships they brought down in France were flying by daylight and at a much lower height than that which they kept whilst crossing this country. As to the second part of the question, I have only to say that the Government have already announced their intention to bomb German towns until an end is put to these cold-blooded attacks by Germany on the civil population of this country. Two such attacks have already been made, and the House may rest assured that the process will be continued until its purpose is attained.

Mr. G. Faber: The right hon. gentleman said only one Zeppelin penetrated the defences of London. Could he make us understand what that means?

Sir G. Cave: I do not think I used that expression. What I said, or what I intended to convey, was that only one Zeppelin crossed over any part of London.

Sir H. Dalziel: Has the right hon. gentleman any information to the effect that immediately before bombs were dropped in a certain very important district an order was given by the War Office to put the whole of the lights on; whether it is the case that the local police protested, and has he any explanation to offer?

Sir G. Cave: I have not heard of that.

Sir H. Dalziel: I will give the information.

In answer to Mr. Kennedy Jones, Mr. Macpherson said a number of our aeroplanes were up over the London area after 10.30 p.m., and a large number were up throughout the whole raid.

Mr. Joynson-Hicks: I propose to ask the leave of the House to move the Adjournment, in order to consider the neglect of the Government to appoint an Air Minister with powers to organise and direct counter-raids on Germany? I submit that the House has not been asked to discuss the non-appointment of an Air Minister.

Mr. Speaker: That would be out of order, because it would involve legislation which, by the way, has already been promised.

Sir Francis Lowe: I beg to ask leave to move the Adjournment of the House, for the purpose of discussing a definite matter of urgent public importance, namely, "the recent air raid on Friday night, and the lack of defence against the same."

The pleasure of the House having been signified, the Motion stood over, under Standing Order No. 10, until a quarter-past eight this evening.

Speaking later on his motion for the adjournment, Sir F. Lowe said: I do not wish in any way to magnify the importance of this air raid. On the contrary, I consider that the damage done and the full effects produced by it were infinitesimal when compared with the expenditure of money and the loss of life which it must have occasioned to the enemy. They certainly failed most abjectly and utterly in the purpose with which that raid was undertaken,

namely, to scare, frighten and intimidate the civil population of London. If I am correctly informed, there was not a single man, woman or child who so much as turned a hair or was frightened in the very least. The casualties, although most regrettable, were comparatively slight and few, and the raid was certainly unproductive of any military advantage whatsoever to the enemy. I do not wish to allege that the precautions taken by the Government and by those whom they have entrusted with the defence of London against attacks of this kind were necessarily inadequate, incomplete or unsatisfactory, but the House and the country are entitled to know what precautions were actually taken and to have an assurance from the Government that everything which it was possible to do to meet and overcome attacks of this kind was done. We are entitled to have a further assurance that the utmost vigilance, care, skill and preparedness will be exercised on all future occasions of this kind.

Mr. Joynson-Hicks: I beg to second the Motion.

I rise in no captious spirit, but rather with a view of eliciting information. I am not sure it was not the Prime Minister who assured us that the Zeppelin menace had been scotched. At all events, it was the general opinion, fostered by those in high authority, that we had nothing much more to fear from Zeppelins. Then we find that on Friday last no fewer than eleven seem to have invaded our country. It is not merely the defence of London with which one is concerned, but of the central portions of the country, as we know, without mentioning details as to places that bombs were dropped on important centres other than in London. It must be quite obvious that it is not desirable to give the Germans more information as to where they were on that expedition than possible. Further, no doubt we were saved by the weather. Possibly the weather made it difficult for our men to attack the Zeppelins, but it was certainly the fact that the Zeppelins lost their way in the fog, which saved us from what might have been a very serious disaster to the capital of the Empire. I want to-night to ask the Government to tell us the full truth, or so much of the truth as they possibly can, in regard to the air defences of this country. If it be that the only defence is an attack on Germany it is better that we should know that, fact fully. I am inclined to think that is the real defence to these air raids but it is better that we should know it fully rather than that we should be given soothing syrup from time to time, as we have been, by members of the Government in the hope that people will not worry themselves further in regard to these air raids, and that the House should be told exactly what the position is from the point of view of the Prime Minister himself.

Mr. Chamberlain: For myself, I have no objection to reprisals or to air raids undertaken into Germany as a measure of punishment and retaliation or as a measure of prevention. But whether we are to undertake those raids or not is a part of the air strategy, or should be, of this war, and it should not be governed by our feelings at a particular moment because there has been a particular raid where a couple of bombs were dropped in London and some shop windows broken, and, unfortunately, a certain number of lives lost. That is a large question of air strategy to be decided by those who have the technical knowledge which enables them to say—and which the great bulk of us and I doubt whether any of us have—whether such operations are desirable or not. They can judge of the advisability of them in the light of facts which are necessarily hidden from all of us here as from the public outside. Air strategy itself is a part of the whole strategy of the war. We do not think it necessary to move the Adjournment of the House every time there has been some movement on the front in France to inquire who was responsible and whether a raid into our trenches could or could not have been prevented. We do not ask which Minister we are to hang because the Germans penetrated our defences at a particular moment. No, Sir, we do no such thing; we leave those matters to those who are fighting our battles in France.

The Londoner, as do the people of the country at large, want this war pursued to the only conclusion which can be satisfactory. They want the Government of the day to bend their whole energies to that. They do not want the House of Commons to interfere by Motions of this kind with the discretion of those who are bearing this great responsibility and bearing it with knowledge which we have not got.

Sir H. Meux: I entirely concur with what the right hon. gentleman has just said. It seems to me we have got to look at this matter from the point of view of common-sense. The perimeter of London and its suburbs is, I suppose, about a hundred miles, and how anybody can suppose that it would be possible by any system of defence to make certain of preventing either aeroplanes or Zeppelins ever coming passes my imagination. Every day and every night aeroplanes pass over our lines in France, our men and officers are bombarded day and night, and I am glad to say we give more of that to the Germans. They do not complain out there, as they know it cannot be stopped, and it cannot be stopped here.

The Chancellor of the Exchequer (Mr. Bonar Law): I intend, so far as I remember them, to deal with some of the main criticisms which have been directed against us before touching upon what I look upon as the main issue. It has been said the Prime Minister had repeated more than once that in this war it was our duty to trust the people, to let them know what was happening, and if that were done we could then rely upon their support. That is true, but I do not think the Prime Minister or any sane man has said that it is our duty to tell our enemies what we are going to do, and to trust our enemies.

It is common knowledge with all of us that these bombing raids are going on continuously behind our lines, and that we are making them behind the German lines, and, so far as our Service is concerned, night and day, in every kind of weather, we are going behind the German lines and bombing them. Only last month—and I mentioned these figures in a speech which I made this afternoon—we dropped behind the German lines in France no fewer than 8,000 bombs. How in the world, by any system, can you prevent these raids taking place? All you can possibly do is to make them as dangerous as you can to the enemy, and that I venture to say we have done and are doing.

I have no intention of giving the House any information at all as to the extent to which the Zeppelins were attacked, but I will say this, and it is common knowledge, our aeroplanes were in the air during the time the Zeppelins were here. I venture to say that nothing, to my mind, would sound worse to the men who, as everyone with the smallest knowledge of the Air Service knows, are running unusual risks in flying by night, than a statement that they were doing nothing to defend London. But let me go a little further. My hon. friend who seconded this Motion said that the Prime Minister had promised long ago that we would do what was possible to bring the air defences of London up to a state of efficiency as high as was possible, and he said: "Tell us what you have done." Does the hon. member forget that we are at war? Does he forget that everything we tell him we tell our enemies, and does he not know that as a guide in all future attacks on London, or any other part of the country, the one thing they would like to know is the particular method of defence which we have made against their attacks, and yet he asks such a question. I will give the House an impression of what that means. The hon. gentleman used an argument which I am not sure was quite relevant, but he was allowed to use it, and perhaps I may be permitted to refer to it. He said the real defence is by air raids on German towns.

But the policy and intention of Germany in that respect was stated more than once in the most clear and unambiguous way. I have had, since we came back, a number of questions put to me about it, and in answering those questions I tried my best to refer to the answers we had given, for once you have stated the air policy I do not think it is improved by stating it every day or twice a

day. I was most anxious to avoid two things, namely, boasting about what we were going to do, and not to give the enemy any information as to what our intentions were. As the House knows, two raids have already taken place over a German town, with a population of 100,000, and apparently my hon. friend thinks that because there are blast furnaces there which can be damaged—and they are vital, remember, to the conduct of the war—that therefore the raid is not so useful as if there were no blast furnaces. What happened in consequence of the pressure of one or two Members of this House and the pressure of the newspapers to find out exactly what was going to be done? It is a fact that the Germans who knew from the only quarter they could know where these raids would take place, sent down a fighting squadron to be ready for our men, and they were ready.

Let us come to the special subject of this Motion, the Zeppelin raid of Friday. If the Germans ever smiled at our method of conducting war they will certainly have a very happy time when, in connection with a Zeppelin raid which was by far the greatest defeat that Germany has ever suffered, they find that the British House of Commons think it necessary to stop its business and adjourn in order to discuss this matter. We were told that there were no aeroplanes up. What happened? Eleven Zeppelins came over to attack London, and only one of them succeeded in passing across London. It was, as the House knows, a misty night, and my hon. friend says it was a misty night that saved London from devastation. How does he know? I will tell him what is the opinion of our Air Service. They think it was a misty night that saved the Zeppelin. Then it is said that no guns were firing. I wish people would use a little more common-sense even about war. Are you going to fire guns because you are told that a Zeppelin has crossed the coast. Is that what they want? As I have said, only one Zeppelin succeeded in crossing over London, and owing to the mist she could not be seen, and she crossed with her engines off, drifting so that it was impossible to hear her. How, then, are you going to fire a gun? Another complaint has been made that the searchlights were not working. The men responsible for our Air Services are not fools. They found that the searchlights would not penetrate beyond the mist and could not reach the Zeppelins at the height at which they were flying. What my hon. friend wants us to do is that we should put on all the searchlights to let the commander of the Zeppelin know exactly where London is so that he can drop bombs over it. The main gravamen of the offence is that these Zeppelins came to England and

got away and not one of them was brought down. But, fortunately, they were brought down in France, and you say, "What splendid fellows the French airmen are and what miserable incompetents the English airmen are!"

Mr. Joynson-Hicks: The right hon. gentleman is making a perfectly unfair statement because I did not say that. I distinctly praised the work of our airmen, and I said I had not one word to say against the Naval Air Service or the Royal Flying Corps.

Mr. Bonar Law: My hon. friend need not excite himself. He said, Look at the proof of the magnificent Air Service in France and the incompetent direction of the Air Service in England. Just let the House remember the same weather conditions which made it impossible for us to see or to attack the Zeppelin was the real cause of the fact that they were lost in France. They lost their way and when drifting over France our French Allies brought them down. I should be the last to deny to the French Air Service the same competency which I claim for our own. They did splendid service in bringing them down, and we are all agreed. In England the Zeppelins were here not only at night but on a misty night when it was almost impossible to see them. They went across the Channel, but it was daylight when they were attacked by the French airmen. I thought my hon. friend would have known this elementary fact, that once a Zeppelin had gone to a great height of 17,000, 18,000 or 19,000 feet she can only do it by letting out gas. She cannot reach that height again, and the longer her journey the lower down she must come, so that when these ships were in France it was in daylight, and they were flying of necessity at a lower altitude they were in this country.

Again, I use a little common-sense. We have proved that when we can see them our pilots can bring down a Zeppelin. Does anyone suggest that we are not as competent now as we were then? I do not think anyone can make that statement, and perhaps it is worth while to mention a fact known to me. These Zeppelins travelled for many hours over France during the darkness. One of them stood over the lines for a long time in the dark and no notice was taken of it, and it was only when daylight came that they were attacked and brought down.

Sir F. Lowe: I wish to ask leave to withdraw this Motion, and if I may say, in doing so—

Mr. Speaker: The hon. gentleman is not entitled to make a second speech. Motion, by leave, withdrawn.

German Tactics in Air Fighting.

"BESIDES the artillery, the German infantry also complain of their airmen," says the *Times* correspondent, writing on October 21st. "We are constantly getting reports from captured officers and so forth that, in the early morning hours especially, their airmen do not put in an appearance, while 'the English come and fire on us in the trenches from a height of 50 metres.' That there is truth in this we know. On one day recently, nine of our airmen came back having fired among them over 10,000 rounds from machine-guns on the men in the trenches and shell-holes or moving along the roads.

"The fighting lately has been very bitter, the German tactics now being generally to fly in large squadrons. Thus, recently, 10 German machines attacked one British which was having a disagreeable time when, happily, another British patrol came along and threw itself into the mêlée. One German machine was sent crashing down and the enemy formation was broken up and withdrew, while our machines came safely home.

"In another case five of our machines fell in with 15 Germans, and a truly gorgeous fight followed. One of our men was attacked by three of the enemy, but shot down one in flames. Another, similarly outnumbered, also accounted for one of the enemy. A third machine had a royal time. He was attacked by what is vaguely called a large number of enemies, one of which came close alongside, but before it could do any harm the struts of its planes were shot away, the two wings on one side crumpled together, and the machine went whirling down. Almost simultaneously another German crossed in front of the British machine and received the next burst from the machine-gun. It broke into flames, and crashed to earth a mass of fire. A third enemy ranged alongside, and was sent down out of control, and then the British pilot thought he had done enough, and made for home. He was chased by yet another enemy of the 15, and suddenly our man, when close to the lines, with the German only 200 yards behind, throttled down and checked to let the enemy pass him. As he passed a burst of fire from the British machine sent him toppling down to the ground.

"With six machines to their credit, four of which had been brought down by one, our men came home content.

"Similar cases, where three of our machines were attacked by eight or more Germans, have not been infrequent, and the whole record of our Flying Corps in this area has been extraordinarily fine."

Mr. Philip Gibbs, writing to the *Daily Telegraph*, says:—

"It is the moving forward of the guns that they want to stop most desperately, and, if there is any visibility through the autumn mists, the German aeroplanes come out, flying as low as they dare and often with great audacity, to spy out any battery on the move and to signal its whereabouts back to their own gunners. They do not come with impunity unchallenged. Every day there are great air fights. Given anything like equal chances, and our men will accept the duel every time. With unequal chances they accept battle, account time and time again for three or four of the enemy,

and escape by great cunning and greater luck, perhaps with punctured wings and a broken strut and a leak in the petrol tank. But the German flying men hunt in packs, and sometimes there is no escape for a lonely boy of ours who gets into a tight corner of the sky with these wolves close upon him. At night they come out again on bombing raids over camps and billets. It is a horrible game of tit-for-tat, in which the enemy gets the worst of it, for we have our own night raiders, monstrous birds who fly out with something like a ton of explosives tucked under their wings, and when those things drop on German docks and aerodromes and dumps and batteries they do not make small holes or destroy in a delicate way. They leave a wake of destruction and death. So that is the 'quietude' on the Flanders front."

Canada and Commercial Aviation.

THOSE in charge of affairs in Canada evidently have no misgivings as to the future of aviation, as in a statement issued by Sir. Robert Borden, the Premier, with regard to the policy of the new Union Government of Canada, it is set forth, among other tasks, in the following: The investigation of the possibilities of air services for important national purposes; the enactment of measures to encourage settlement on the land.

R.N.A.S. Comforts Fund.

AN appeal has been issued by Mrs. Sueter to all those who have helped the Royal Naval Air Service Comforts Fund during the last three years to continue their support in the coming winter. Parcels of warm comforts, such as mufflers, mittens, helmets, jerseys, cardigans (khaki or dark blue), and socks (any colour) will be most welcome, and should be sent to Mrs. Henry Balfour, Langley Lodge, Headington, Oxford, while donations and cheques should be forwarded to the Hon. Treasurer, R.N.A.S. Comforts Fund, London City and Midland Bank, 129, New Bond Street, London. The Fund, which is registered under the War Charities Act, 1916, has distributed over 150,000 comforts during the last three years.

Long Flight by Russian Pilot.

FROM Petrograd on October 19th came news of the arrival at Vladikavkaz of a Russian military pilot who recently started from Tiflis and crossed the Caucasus mountains, the journey occupying 10 hours.

A New German Aerodrome in Belgium.

INFORMATION has been received at Amsterdam, that at Maldegheem, among the work which the Belgians are being forced to carry out is that of the construction of a German aerodrome.

A New German Giant.

URGING the French Government to strain every nerve to speed up the supply of aeroplanes, the *Temps* states that according to a German aviator prisoner the bombardment groups which the Germans are building in their endeavours to forestall the American machines include a giant biplane with four motors employing bombs weighing over 660 lb. The German aeroplanes made in the month of July reached a total of 2,000, and no effort has been spared to increase the number.

Models

The Burchall Monoplane.

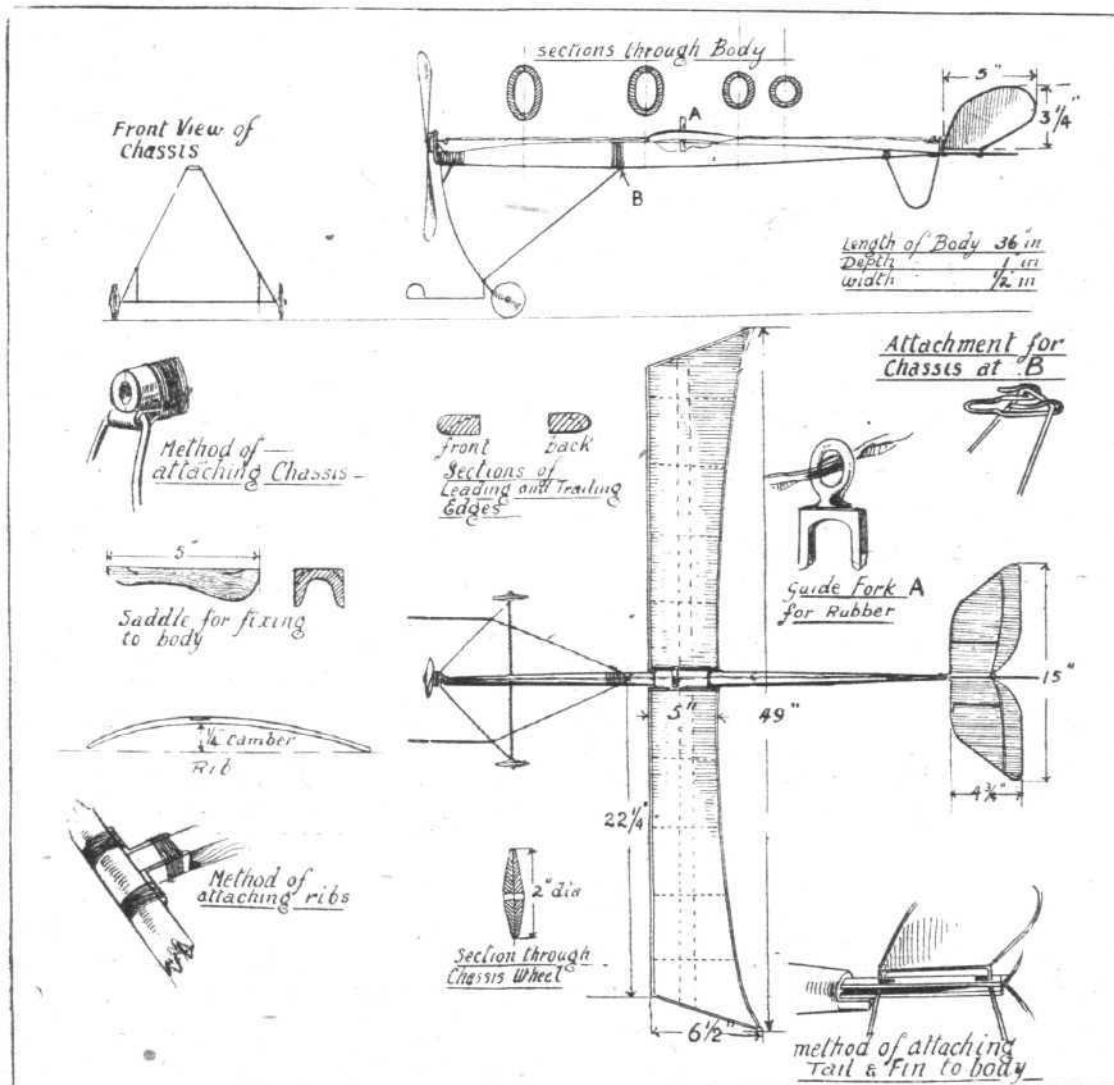
ONE of the most enthusiastic members of the Finsbury Park and District Model Aero Club is Mr. C. J. Burchall, and many model makers will doubtless be interested in the following description and the drawings of one of his very successful models.

The main plane, it will be seen, has a span of 49 ins., but the leading edge is only $44\frac{1}{2}$ ins.; the chord is 5 ins. at the centre and $6\frac{1}{2}$ ins. at the ends. For the front and back of the plane $\frac{1}{4}$ by $\frac{1}{8}$ birch, with one edge rounded off, is used, while the ribs are also of birch, $\frac{1}{8}$ in. by $\frac{1}{16}$ in. in section. One of the sketches shows the way in which each rib is fastened at the front and back by little angle plates of aluminium or tin, bound with cotton well saturated with seccotine or liquid glue. In order to assist the main planes to maintain their shape a strip of wood $\frac{1}{16}$ in. thick is let into the tops of the ribs; each joint should be smoothed down flush, and the bottom edges should be rounded off to lessen resistance. It should be fastened in place with glue and cotton. When the framework is complete, the spaces along the main spars between the ribs are filed away to the dotted line shown in

The tail is made of 20 gauge steel piano wire with the joints bound with fine iron wire and soldered, the ribs are attached in the same way.

One of the sketches shows how the tail is clipped between two pieces of birch $\frac{3}{16}$ in. by $\frac{1}{8}$ in., the ends of which are lashed to the rear of the body—which is cut away to take them—by glue-soaked cotton. The fin or rudder is made in a similar way to the tail, and it is lashed by the two hooks to the top piece of birch. Both the tail and fin are covered with the same material as the main plane.

The chassis is made of 18 gauge wire, and its shape is clearly shown in the drawing. The joints are made as in the tail. It is hinged in front by a strip of aluminium bent double which is lashed to the body at the same time as the bearing which carries the propeller. At the back, the wire is formed into a hook which slips into a loop, and permits of a shock-absorber effect being obtained should the model make a bad landing. The wheels are made of two pieces of mahogany with the grain at right angles. They are shaped as shown and glued together. The hub is formed of a piece of brass by-pass tubing, and a washer is soldered on each side.



Plans and details
of Mr. C. J. Burchall's mono-
plane.

the section. The plane is then covered with proofed silk, stretched tightly from the centre to the end of the plane.

The backbone of the model is made from two pieces of satin walnut, 3 ft. long by 1 in. by $\frac{1}{4}$ in.; they are clamped together and first shaped from an oval section in the centre to a smaller oval at the front and a circular end, then after being hollowed out as much as possible they are glued together and well clamped up between two boards until the joints are set. The outside can then be sandpapered and finished.

The saddle piece is carved out to carry the plane, and on to this is fixed a boxwood guide for the rubber to run through and keep it clear of the plane, the forked ends of this fitting are glued to the saddle.

The propeller, to Mr. Burchall's own design, which has proved successful not only on his own model but on those of other members of the club, is carved from satin walnut $\frac{1}{2}$ in. thick. It is 14 ins. in diameter, and is of compound pitch.

The model weighs 6 ozs. complete, carrying six strands of A. E. Jones rubber, weighing $\frac{3}{4}$ oz. With 600 turns of the propeller the model has flown well over 400 yards.

Probably some of our readers may care to build a similar model, and should experience no difficulty after studying the drawings and sketches. In conclusion, it may be pointed out that all the materials used were obtained from Messrs. A. E. Jones, Ltd.

More Aeroplanes from Overseas.

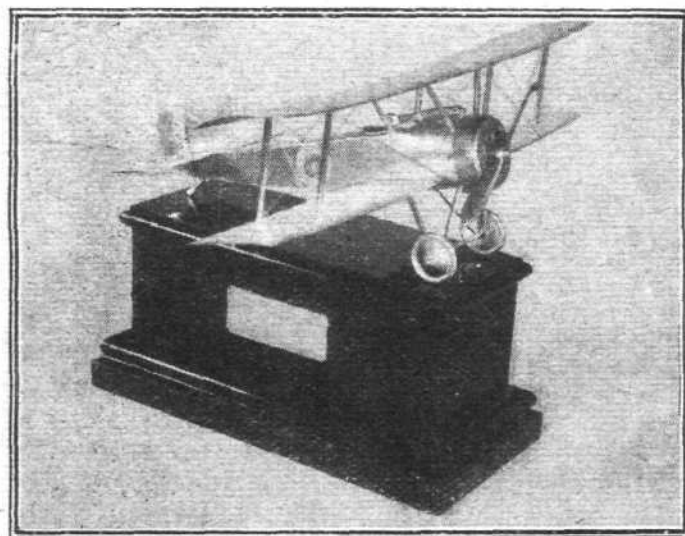
THE original idea of the Patriotic League of Britons Overseas of presenting a warship to the Admiralty having been found difficult to carry out, the committee of the league resolved to devote the money entrusted to it to the provision of aircraft. The committee has accordingly given to the air services 12 seaplanes and 29 aeroplanes, which have been named after the branches whose donations met their cost. Of the exploits of many of them the committee have received confidential reports, which they have forwarded to the donors.

An Employer's Duty.

REGULATIONS require employers of labour to make a return of all male employees from 16 years of age, and on a form, D.R.17, obtainable at any Post Office, to the Recruiting Officer of the district in which the men work. A duplicate form should be kept by the employer on the premises, and both should be revised monthly if the occasion arises. Failure to comply with this regulation entails heavy penalties under Defence of Realm Regulations, 41A.

To Readers—One and All.

THE Editor of "FLIGHT" will at all times be pleased to consider original articles (illustrated or otherwise) on subjects directly or indirectly allied with aviation. All articles accepted will be paid for; a high literary standard of writing is not essential; it is the facts which matter. Practical explanatory articles are most acceptable. Diagrams and similar illustrations need only be rough sketches if necessary.



The beautiful silver model, the work of the Goldsmiths' and Silversmiths' Company, which was presented to the Lord Mayor last week at the Whitehead Aerodrome function, it being handed to Sir W. H. Dunn by Miss Helene Whitehead. The inscription on the plinth was:—"Presented to Colonel the Right Honourable Sir W. H. Dunn, Bart., Lord Mayor of London, at the inauguration of the Hanworth Park Aerodrome, October 16th, 1917."

IMPORTS AND EXPORTS, 1916-1917.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; for 1914, see "FLIGHT" for January 15th, 1915; for 1915, see "FLIGHT" for January 13th, 1916; and for 1916, see "FLIGHT" for January 11th, 1917.

	Imports.		Exports.		Re-Exportation.	
	1916.	1917.	1916.	1917.	1916.	1917.
January ...	1,509	10,842	6,399	67,033	Nil.	Nil.
February ...	6,444	9,479	30,693	26,512	—	6
March ...	3,388	11,158	17,872	58,517	7	—
April ...	3,383	21,141	22,608	21,151	3,783	—
May ...	1,986	6,877	26,165	59,713	300	—
June ...	4,986	2,670	50,287	14,647	—	—
July ...	2,072	9,104	12,932	106,250	—	—
August ...	2,583	18,680	13,555	68,315	420	258
September ...	1,076	9,047	36,048	56,491	—	30
	27,427	98,998	216,559	478,629	4,510	294

COMPANY MATTERS.

Aircraft Manufacturing Co., Ltd.

THE British Foreign and Colonial Corporation invites applications for the purchase at 21s. each of 250,000 seven per cent. cumulative and participating "B" preference shares of £1 each in the Aircraft Manufacturing Co., which was formed as a private company in 1912 and now has a capital of £402,500 divided into 100,000 seven per cent. cumulative preference, 250,000 seven per cent. cumulative and participating "B" preference, 50,000 preferred ordinary and 50,000 deferred ordinary, the latter being of 1s. denomination. The shares now offered are entitled to a fixed preferential dividend at the rate of 7 per cent. per annum and to a participation of 20 per cent. of the amount by which the remaining profits which it shall be determined to distribute in any year shall exceed £5,000. Mr. George Holt Thomas, Chairman and managing director of the company, in the course of a letter on the position of the company, states that the business is to supply aeroplanes, motors and parts of every description; that the buildings cover 15 acres and that to-day 3,850 hands are employed. During the year ended March 31st, 1914, the sales amounted in value to £198,746; in 1915 to £292,557; 1916, £689,326; and during the twelve months ended 31st March last to £2,608,018. The next profits in the last period are certified to have been £107,361, as against £60,905 the previous year, while the excess of assets over liabilities (excluding share capital) on March 31st last amounted to £277,645. Mr. Holt states that on the basis of profits for the past year the fixed dividend on "B" preference is covered more than five and a half times. Applications will be received through the London City and Midland Bank and Lloyds Bank; the lists will close on or before the 3rd proximo.

NEW COMPANIES REGISTERED.

AERO-ACCESSORIES, LTD.—Capital £2,000, in £1 shares (500 preference).

AIRCRAFT EQUIPMENT CO., LTD., Actinorae Works, Oaklands Road, Cricklewood, N.W.—Capital £2,500, in £1 shares. Acquiring business carried on at Oaklands Road, Cricklewood, N.W., as the Aircraft Equipment Co. First directors:—H. Tilney, E. Tilney, and B. Quint.

EYE BOLTS, LTD., 5, Waterloo Street, Birmingham.—Capital £3,000, in £1 shares. Manufacturers of and dealers in eye bolts and aeroplane fittings and components, &c.

BUSINESS NAMES REGISTRATIONS.

MODEL AIRCRAFT SUPPLY CO.—Registered October 6th, 1917. Mail order business, 79, Rosebery Crescent, Jesmond, Newcastle-on-Tyne. Proprietor, William E. Appleby (British), same address. Business commenced September 28th, 1917.

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